WHY IS CORRUPTION SO MUCH MORE TAXING THAN TAX? ARBITRARINESS KILLS

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Than Tax? Arbitrariness Kills
Shang-Jin Wei
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ABSTRACT

This paper examines the effect of corruption-induced uncertainty on foreign direct investment. The measure of uncertainty is constructed based on unpublished individual survey responses on levels of corruption in host countries. The result is striking. The effect is negative, statistically significant and quantitatively large. An increase in the uncertainty level from that of Singapore to that of Mexico, at the average level of corruption in the sample, is equivalent to raising the tax rate on multinational firms by 32 percentage points. Hence, the second-moment (uncertainty) effect can and does have first-order importance.

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Section 1: Introduction

There is an increasing recognition of the menace of corruption on economic performance. See Rose-Ackerman (1976, 1978), and Shleifer and Vishny (1993 and 1996) for important theoretical work and Paulo Mauro (1995) for an empirical work on the effect of corruption on economic growth.

There are recent empirical studies looking at the effect of corruption on international direct investment. Using data on American multinational firms' activity, Hines (1995) examined the impact of the U.S. Foreign Corrupt Practice Act and reported that the American firms tend to invest less in more corrupt countries after 1977. Using a broader data set on foreign investment from fourteen source countries to forty five host countries, Wei (1997) found that corruption in host country has a negative effect on inward foreign direct investment from all source countries in a way that is statistically significant and quantitatively large. An increase in the corruption level from that of Singapore to that of Mexico is equivalent to raising the tax rate on multinationals by over twenty percentage points[1].

On the other hand, the realized corruption payment as a share of profit or sale is not very high. Kaufmann (1997) reported surveys in Ukraine and Russia (two countries with very high levels of corruption) on the exact amount of corruption payments firms have to make to obtain services, to get an import/export license, or to sooth tax inspectors and so on. He found that these payments, on average, amounted to a small percent of the sales.

Why does corruption discourage foreign investment so much more than a tax? One explanation that this paper focuses on is that corruption, unlike tax, is not transparent, not pre-announced, and carries a much poorer enforcement of an agreement between a briber and a bribee. In other words, corruption embeds arbitrariness and creates uncertainty. The extent of the corruption-induced uncertainty is likely to vary from country to country, even after controlling for

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[1] Furthermore, Wei (1997) found no support for the view that foreign investment is less sensitive to corruption in East Asia. And, contrary to Hines (1995), while American firms have less investment in corruption-prone countries, they are not statistically different from other major investors.

average level of corruption. The difference in uncertainty is derived from the difference in the way bribe-demanding bureaucrats are organized. A monopolist rent-maximizing bureaucrat would in fact have a more or less transparent bribe schedule with more or less assurance of results. To firms in such a country, bribe payment is like a tax, except that it goes into the bureaucrat's pocket rather than the government treasury. In a country where a number of bureaucrats can impose independent bribes on firms seeking complimentary licenses to operate, corruption has greater uncertainty over total payment and eventual results, particularly if there is free entry for new bureaucrats to impose new licenses on firms. This is what Shleifer and Vishny (1993) called "the industrial organization of corruption."

This paper aims to quantify, I believe for the first time in the literature, the importance of "arbitrariness" or uncertainty in bribes on foreign investment. In other words, previous empirical papers have concentrated on the first moment (average level) effect of corruption, whereas this paper examines the second moment (variability) effect. I will argue that the second moment effect has first-order quantitative importance in terms of its discouraging effect on foreign investment.

A crucial step in this investigation is constructing a measure of this arbitrariness or uncertainty. I do so by making use of the unpublished individual responses of corruption rankings (as opposed to average rankings) from a survey conducted for the 1997 Global Competitiveness Report. The justification and the construction will be explained in the data section.

The structure of the paper is the following. Section 2 discusses the conceptual issues about uncertainty induced by corruption. Section 3 explains the data. Section 4 reports the statistical results. And Section 5 concludes the paper.

Section 2: A Simple Model of Corruption-induced Uncertainty

It is not that hard to imagine that investors in general dislike uncertainty induced by arbitrariness in corruption. I will present a simple model of foreign investor in a corrupt host country. Corruption is modeled as a distortionary tax, except that, before production takes place, it is a random variable whose distribution is known to the investor.

Let us assume that corruption-induced uncertainty is uncorrelated with the world market prices of the firms' output and inputs, so it represents an undiversifiable risk. For simplicity, in the model, I let bribe rate be the only random variable. Furthermore, investors' objective is to maximize their profit in the host country. Output is produced by a single input (say, capital), x, supplied by the investor.

A representative foreign-invested firm's profit in a corrupt host country is given by

$$\Pi = (1-q)\, f(x) - c\, x$$

where q, corruption level, is a random variable with mean μ and variance σ^2. f(.) is a twice differentiable, weakly concave production function. This specification assumes that, without uncertainty (σ^2=0), corruption would work like a distortionary tax.

The foreign investor is a mean-variance optimizer, attempting to maximize the following utility function

$$U = E\,\Pi - \frac{\rho}{2}\, Var\,(\Pi)$$

where ρ is the absolute risk aversion parameter. This utility function can be justified in two ways: either that the investor is maximizing the expected value of a negative exponential utility function, or q (and hence her profit) is normally distributed so that the first two moments give a complete description of the distribution.

The optimal choice of her input is given by the following first order condition

$$(1-\mu)\, f'(x) - \rho\ \sigma^2 f(x)\, f'(x) = c$$

Totally differentiating this equation, one gets

$$\{\ (1-\mu) f''(x) - \rho\ \sigma^2\ [\ (f'(x))^2 + f(x)\, f''(x)\ ]\ \}\ dx$$

$$- f'(x)\, d\mu + \rho f(x) f'(x)\, d\sigma^2$$

Under the condition that the production function is not too far away from constant returns to scale,

$$-\frac{f''(x)}{f'(x)} < \frac{f'(x)}{f(x)}$$

(for example, $f(x) = Ax^{\alpha}$, where $\frac{1}{2} < \alpha \leq 1$, satisfies the condition), it is easy to verify that $dx/d\mu<0$ and $dx/d\sigma^2<0$. In other words, other things equal, the higher the average corruption level in the host country, the less foreign investors would invest. Holding the mean corruption level constant, the higher the variability of the bribe rate, the lower would be foreign investment.

Section 3: Data

Since the index for arbitrariness-induced uncertainty is a key variable in this paper, I will explain its construction and justification in details before describing others.

Arbitrariness-induced uncertainty

My indicator for corruption-induced uncertainty is based on 2381 individual responses to a question (Question 8.02) on corruption in the survey conducted for the 1997 Global Competitiveness Report. The question asks respondents to rate the level of corruption according to the extent of "irregular, additional payments connected with imports and exports permits, business licenses, exchange controls, tax assessments, police protection or loan applications." The data was kindly supplied by Dr. Frederick Hu, Head of Research at the World Economic Forum.

I assume that each response is correlated with the respondent's individual experience with various aspects of corruption in that country, including (a) how much to pay, (b) how often to pay, and © whether the results can be guaranteed after the payment. Consider two countries. In Country A (say Indonesia) where who to pay bribes to and how much to pay are well-understood, and the result is more or less guaranteed once an appropriate amount of bribe is paid, bribe works like a tax. Investors' experience are likely to resemble each other. In Country B (say Colombia or Ukraine) where many bureaucratic agencies can impose independent bribe demands on foreign investors without being able to give any assurance of results, investors' experience with how much to pay and what the result would be after the payment is likely to be more dispersed. When firms are asked to rate corruption level in these countries, the ratings on Country B are likely to have a greater dispersion that those on Country A, even if average bribe payment as a share of the profit may be the same in both countries.

The 1997 Global Competitiveness Report (GCR), sponsored by the World Economic Forum, a Europe-based consortium with a large membership of multinational firms, contains the average of corruption ratings from a survey of its members in late 1996 about various aspects of "competitiveness" of the host country that the responding firm invests in. A total of fifty-eight host countries were covered by the survey. Instead of using the average corruption perception published in the report, I make use of the unpublished individual responses to construct a measure of uncertainty. There are, on average, 41 responses per host country.

As an illustration, Figure 1 presents six examples of the density functions of individual corruption ratings. Singapore and Norway in the top panel are examples of countries that have low average perceived corruption (1.24 and 1.31 on a scale of one to seven, respectively) and almost all respondents think alike (the standard deviations are 0.64 and 0.48, respectively). Colombia and Ukraine in the middle panel are examples of countries that have high average corruption (5.19 and 4.31, respectively) but individual responses are very dispersed (standard deviations are 1.75 and 2.20, respectively). Finally, Indonesia and Thailand in the lower panel are countries with as high an average corruption (5.56 and 5.55, respectively) as those in the middle panel but less dispersed individual ratings (1.09 and 0.93, respectively).

I would have liked to construct my uncertainty indicator based on survey responses in earlier years, as the dependent variable in the subsequent regressions, stock of foreign investment, was only available for 1991. Unfortunately, this is the only individual response data that I can get. So the maintained assumption is that cross-country difference in uncertainty in early 1990's is correlated with that in 1996. [2]

Of course, the variation of individual responses could reflect many other influences[3]. So naturally there is measurement error in my indicator. It is important to keep this in mind when interpreting the statistical results later: the effect of uncertainty on foreign investment is likely to be underestimated.

As a partial validation of the standard deviation of responses as an index of uncertainty, we turn to a look at the correlation between the standard deviation and average perception of corruption. In order to explain the large taxing effect of corruption indicated at the beginning of the paper, one would think that uncertainty and average corruption level would have to be positively correlated. As it turns out, the two do have a positive correlation coefficient of 0.51 in the GCR sample.

Figure 2 shows a scatter plot of the uncertainty index against average corruption rating for the 58 countries in the GCR survey. The thick line is the regression line which, as expected, has a positive slope. The two broken lines correspond to the means of the average corruption and uncertainty, respectively. The two lines classify the space into four quadrants. As we can see, most countries that have low average corruption also tend to have low uncertainty. On the other hand, countries that have high average corruption can have either high or low uncertainty.

Corruption measures

I have different measures of average corruption levels from three sources. The first is Business International (BI) index, which is based on surveys conducted during 1980-83, and ranks countries from one to ten, according to "the degree to which business transactions involve corruption or questionable payments. The data is kindly provided by Paolo Mauro, who collected them by hand

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[2]On the other hand, the average corruption indicator I will use was computed using pre-1991 data.

[3] For example, if I had the data, I would like to control for industry and other characteristics of the respondents.

from BI's archives. The second source is Transparency International (TI), an agency dedicated to fighting corruption worldwide. The TI index is an average of ten surveys of varying coverage over a number of years. The third source is 1997 GCR as explained previously. The three indices are highly positively correlated. For example, the correlation coefficient between the BI and the TI (or GCR) indices is 0.88 (or 0.77).

For all three indices, the original rating system is such that a small number means more corruption. To avoid awkwardness in interpretation, I have re-scaled the three indices (explained at the bottom of Table 1) so that a large number implies more corruption. All the regression results presented in the paper use the BI index as a measure of average corruption. But all the qualitative results can be replicated using the other two measures (not reported to save space).

Other Data

The dependent variable is bilateral stock of foreign direct investment in 1991 from fourteen major source countries to forty one host countries. The data comes from outward FDI by destination reported by individual source countries in the OECD data base. The source countries include the seven largest in the world: the United States, Japan, Germany, the United Kingdom, France, Canada and Italy. The number of host countries is constrained by availability of data on corruption, uncertainty and tax.

For host countries' tax rate, I use the 1989 number as tax rates do not change very much over 1989-1991. The actual measure is the minimum of two numbers: the statutory marginal tax rate on foreign corporations as reported by Price Waterhouse (1990), and the actual average tax rate paid by the foreign subsidiaries of American firms in that country. The data on twenty eight of the host countries are taken from Hines and Desai (1996, Appendix 2). The rest are obtained using the Price Waterhouse source with the kind assistance by Mihir Desai.

The GDP data comes from the International Monetary Fund's International Financial Statistics data base. In a few cases where GDP data are not available, GNP data are substituted in. The wage data are obtained from the International Labor Organization with the kind help of Dr. Xiaolun Sun.

The bilateral distance data measures the "greater circle distance" between the economic centers in source-host pairs. The dummy on linguistic tie takes the value of one if the source and host countries share a common language, and zero otherwise. Both data have been used in Frankel, Stein and Wei (1995).

Table 1 reports the summary statistics for some of the key variables in this paper. The average corruption level in the sample (BI-index) is 3.70 on a scale of one-to-ten. The average corruption-induced uncertainty among the forty one countries used in the subsequent regressions is 1.05, with the minimum and maximum being 0.44 and 1.75, respectively. The average tax rate is 0.34.

Section 3: Statistical Results

Specification and Benchmark

One could run an Ordinary Least Square specification of the following sort

$$\ln(FDI_{i,j}) = X_{ij}\beta + u_{ij}$$

where FDI_{ij} is the stock of foreign investment from source country I to host country j, and X is a vector of regressors including the host country's GDP in logarithm and the distance between the source and host countries in logarithm. Experience indicates that, in analogy to the gravity specification on trade flows, the logarithmic transformation on both sides of the equation (of the dependent variable and of most of the regressors), called double-log linear specification, produces the best functional fit[4].

Many host countries receive no direct investment from some source countries. A serious drawback of the double-log linear specification is that zero FDI observations are dropped by this specification. It is natural to think about using a Tobit specification to replace the OLS. The problem

[4] When such OLS specification is run, the estimates of both tax variable and corruption measure are negative and statistically significant. We omit these results to save space. See Table 2 in Wei (1997) for some results where the FDI flow was used as the dependent variable.

there is that the simple Tobit specification conflicts with the double-log transformation, as log of zero is not defined. To deal with this problem, I will employ the following specification in this paper:

$$\ln(FDI_{ij}+A) = X\beta + u_{ij} \qquad if\ X\beta + u_{ij} > \ln(A)$$

$$= \ln(A) \qquad if\ X\beta + u_{ij} \leq \ln(A)$$

where A is a threshold parameter to be estimated. u is an i.i.d. normal variate with mean zero and variance σ^2. In this specification, if $X\beta$+u exceeds a threshold value, ln(A), source country I accumulates a positive stock of investment in host country j; otherwise, the realized foreign investment is zero (and the desired level could be negative). I use the maximum likelihood method to estimate this equation. Eaton and Tamura (1996) pioneered a version of this specification. Wei (1997) provided a derivation of the likelihood function.

As a benchmark for comparison, I first estimate a specification without the uncertainty indicator. The two key regressors are tax rate and average corruption level (BI index). Besides them, I have also included source country dummies, host country's GDP in logarithm, distance between the source and host countries in logarithm, and a dummy indicating if the source and host countries share a common language. The last two regressors are motivated by recent emphasis on the importance of networks in trade and investment as in the work of Rauch (1996).

The result is presented as Column 1 of Table 2. Both tax rate and corruption measure have negative and statistically significant coefficients. A one percentage point increase in tax rate reduces FDI by 1.92 percent. A one step increase in corruption rating is associated with an increase in the tax rate by 4.69 percentage points[5]. Therefore, an increase in corruption level from that of Singapore (with a BI corruption rating of 1) to that of Colombia (with a BI corruption rating of 6.5) is equivalent to raising the tax rate by 25.8 percentage points[6]. Similarly, an increase in the average

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[5] 0.09/(0.01X1.92) = 4.69.

[6] (6.5-1) X 4.65 = 25.8.

corruption level from that of Singapore to that of Mexico (with a BI corruption rating of 7.25) is equivalent to raising the tax rate by 29.3 percentage points[7].

Corruption-induced uncertainty

To investigate the effect of corruption-induced arbitrariness, I augment the basic specification with an additional regressor, "Uncertainty X Corruption." I add the interactive term rather than Uncertainty alone because the effect of uncertainty depends on having corruption in the first place. In a country without corruption, there is no effect of corruption-induced uncertainty to speak of. Thus, in the final specification

$$X\beta = \beta_1 tax_j + (\theta_1 + \theta_2\, Uncertainty_j)\, Corruption_j + Z_{ij}\gamma + u_{ij}$$

where Z is a vector control variables other than tax, corruption and uncertainty. The rest of the specification is the same as before. If the hypothesis that uncertainty discourages FDI is valid, we would expect that $\theta_2 < 0$.

Column 2 of Table 2 reports the regression result. The effect of tax on FDI is negative and significant, though with a somewhat smaller point estimate (-1.65). The estimated effect of uncertainty, θ_2, is indeed negative and statistically significant. Holding the average corruption level constant, an increase in uncertainty is associated with a reduction in FDI.

At the average level of corruption in the sample (when BI index=3.70 according to Table 1), a 0.1 increase in uncertainty is equivalent to raising the tax rate by 4.71 percentage points[8]. **At the average level of corruption (3.70), an increase in uncertainty from the Singapore level (0.64) to the Mexico level (1.32) is equivalent to raising the tax rate by 32 percentage points[9]; an increase to the Colombia level (1.75) is equivalent to raising the tax rate by 54 percentage**

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[7] (7.25-1) X 4.65 = 29.3.

[8] (0.1X0.21X3.70) / (0.01 X 1.65) = 4.71.

[9] (1.32-0.64)X0.21X3.7 / (1.65X0.01) = 32.

points[10]. This effect is quantitatively big if we recall that the average tax rate in the sample is only 34%.

Interestingly, in this specification, the estimate of θ_1 is positive (0.18). At the average level of uncertainty (1.14 in the sample according to Table 1), the effect of an increase in corruption is still an unambiguous reduction in FDI. When uncertainty is high enough (greater than 0.86), an increase in corruption always reduces FDI. But if we interpret the point estimates literally, at low enough uncertainty (if it is below 0.86), a increase in corruption could increase FDI. Of course, this interpretation may take the estimates too literally[11].

Robustness Checks

I now turn to a series of sensitivity tests to make sure that the main result regarding the effect of the corruption-induced uncertainty is robust.

One possible missing variable in the above regression is political stability. Political stability in a host country may promote inward FDI. At the same time, political stability may be negatively correlated with corruption-induced uncertainty as well as level of corruption. A political instable government may cause bureaucrats at all levels to try to grab rents whenever and wherever they can. Conversely, a very corrupt and uncertain government may breed public discontent and lead to political instability. Regardless of the direction of causality, it is possible ex ante the estimated effect of uncertainty on FDI may be a disguised effect of political instability.

To check for this, I add a measure of political stability also from the Business International source. The index, as expected, is negatively correlated with uncertainty (with a correlation coefficient of -0.31) and with corruption (with a correlation coefficient of -0.69 with the BI corruption index). When this measure is added to the regression, reported in Column 3 of Table 2,

[10] (1.75-0.64)X0.21X3.7 / (1.65X0.01) = 54.

[11] This positive coefficient basically goes away when I later use a simple semi-nonparametric approach, namely coding the uncertainty indicator and corruption measure as high/low binary dummies.

it does have a positive point estimate, consistent with the idea that stability promotes FDI. However, it is not statistically significant at the ten percent level. More importantly, it does not make a dent on the estimated effect of uncertainty on FDI.

Another possible missing regressor is the degree of red tape or bureaucracy. It seems reasonable to expect that more red tape would give bureaucratic agencies more opportunity to impose independent bribes on foreign investors, so it is probably positively correlated with both the uncertainty indicator and the corruption measure. I use an indicator from the BI source, which is correlated with uncertainty (with a coefficient of 0.37) and average corruption (with a coefficient of 0.88). When the red tape indicator is added to the regression, reported in the last column of Table 2, it does produce a negative coefficient (-0.06), but is not statistically significant. Again, the estimated effect of uncertainty on FDI is virtually unchanged.

Adding labor market variables

A common hypothesis of foreign investment is that multinational firms chase cheap labors. To control for this, I collected hourly wage data from the International Labor Organization and add log(wage) as an additional regressor, together with an OECD dummy for host countries that were members of OECD in 1991. Because of the limited wage data available, this procedure cuts down the sample size by 17% (from 545 to 450 observations). In any case, the result is reported as Column 1 of Table 3. Consistent with the FDI chasing cheap labor hypothesis, the wage variable does have a negative and statistically significant coefficient: a one percent increase in host country wage is associated with a 0.25 percent reduction in inward FDI stock. It is important to note that, on this smaller sample and with this newly added labor market variable, the estimated effect of corruption-induced uncertainty on FDI still stays the same.

Column 2 of Table 3 adds an interactive term between log(wage) and OECD dummy, on the ground that foreign firms' sensitivity to host country's labor cost may depend on whether the host is a developing or developed country. In any case, the interactive term is not statistically significant. Other results do not change.

Binary coding of corruption and uncertainty

The continuous measure of uncertainty and the one-to-ten step ratings of corruption may have put too much fine gradation into them. The estimated results reported above could be influenced by a few outliers. As a check for this, I have re-coded the uncertainty and corruption measures to be binary variables. Specifically, I define a high-uncertainty dummy, "H-uncertainty," to be one if the continuous measure is greater than 1.55 and zero otherwise. Similarly, a high-corruption dummy, "D-corruption," equals to one if the BI-index exceeds 3, and zero otherwise.

Table 4 essentially reproduces Table 2 with the two binary measures of uncertainty and corruption. Without the uncertainty variable, the "H-corruption" dummy still produces a negative coefficient that is significant at the ten percent level.

The key equation to focus on is Column 2. The "H-corruption" variable and the interactive term "H-uncertainty X H-corruption" essentially classify all countries into three category: low corruption countries, highly corrupt but low uncertainty countries, and highly corrupt and highly uncertain ones (Recall that there are very few observations in the sub-category of low corruption and high uncertainty). The coefficient on "H-corruption" is negative (-0.06) but not significant. This means highly corrupt countries with low uncertainty have only slightly less FDI than low corruption countries. On the other hand, highly corrupt and highly uncertain host countries obtain substantially less FDI than otherwise. In other words, the estimated negative effect of corruption on FDI came mainly from substantially lower FDI in the highly uncertain countries.

FDI Flow

In the regressions reported so far, the dependent variable is (suitably transformed) the stock of bilateral investment at the end of 1991. One may be concerned that the FDI stock reflects largely historical influence, whereas our measures of corruption and corruption-induced uncertainty describe only recent events. To address this concern, this subsection re-do some of the key regressions with the flow of bilateral investment (suitably transformed) over 1990-91 as the dependent variable.

The two-year cumulative flow of FDI is defined as the end of 1991 stock minus the end of

1989 stock. In the sample, the two year flow accounts for 38.8 per cent of the stock on average. So a substantial portion of the bilateral stock comes from recent investment. The correlation coefficient between the stock and flow measures is 0.70, implying that the spatial distribution of the new flow is largely consistent with that of the existing stock.

Table 5 replicates Table 2 with the bilateral flow now becoming the dependent variable. In Column 1 where uncertainty is not added to the regression, both tax rate and corruption have negative coefficients that are statistically significant. An increase in the corruption level from that of Singapore (with a BI corruption rating of 1) to that of Colombia (with a BI corruption rating of 6.5) is equivalent to raising the tax rate by 31.0 percentage points[12].

In Column 2 where "uncertainty x corruption" is added as a regressor, the new regressor has a negative and statistically significant coefficient. At the average level of corruption (3.70), an increase in uncertainty from the Singapore level (0.64) to the Colombia level (1.75) is equivalent to raising the tax rate by 42 percentage points[13]. Thus, the effect of corruption-induced uncertainty on the flow of bilateral FDI is very similar to what we have found using the FDI stock data.

In Columns 3 and 4, political stability and red tape are added one by one to the specification. Neither of them is statistically significant. Adding them to the regression does not alter our inference regarding the effect of corruption-induced uncertainty on foreign investment.

Section 5: Concluding Remarks

This paper makes an assessment of the effect of corruption-induced uncertainty on foreign direct investment. Uncertainty is measured using the dispersion of individual ratings of corruption level of host countries.

The result is striking. The effect of uncertainty on FDI is negative, statistically significant and quantitatively large. An increase in uncertainty from the level of Singapore to that of Mexico, at the average level of corruption in the sample, is equivalent to raising the tax rate on multinational firms

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[12] [(6.5-1) x 0.12] / (0.01 x 2.42) = 31.0.

[13] [(1.75-0.64)x0.23x3.7] / (0.01 x 2.27) = 41.6.

by 32 percentage points. Given that our measure of uncertainty is likely to contain measurement error, the estimate reported here should be regarded as a lower bound. Hence, the second-moment (uncertainty) effect can and does have first-order importance.

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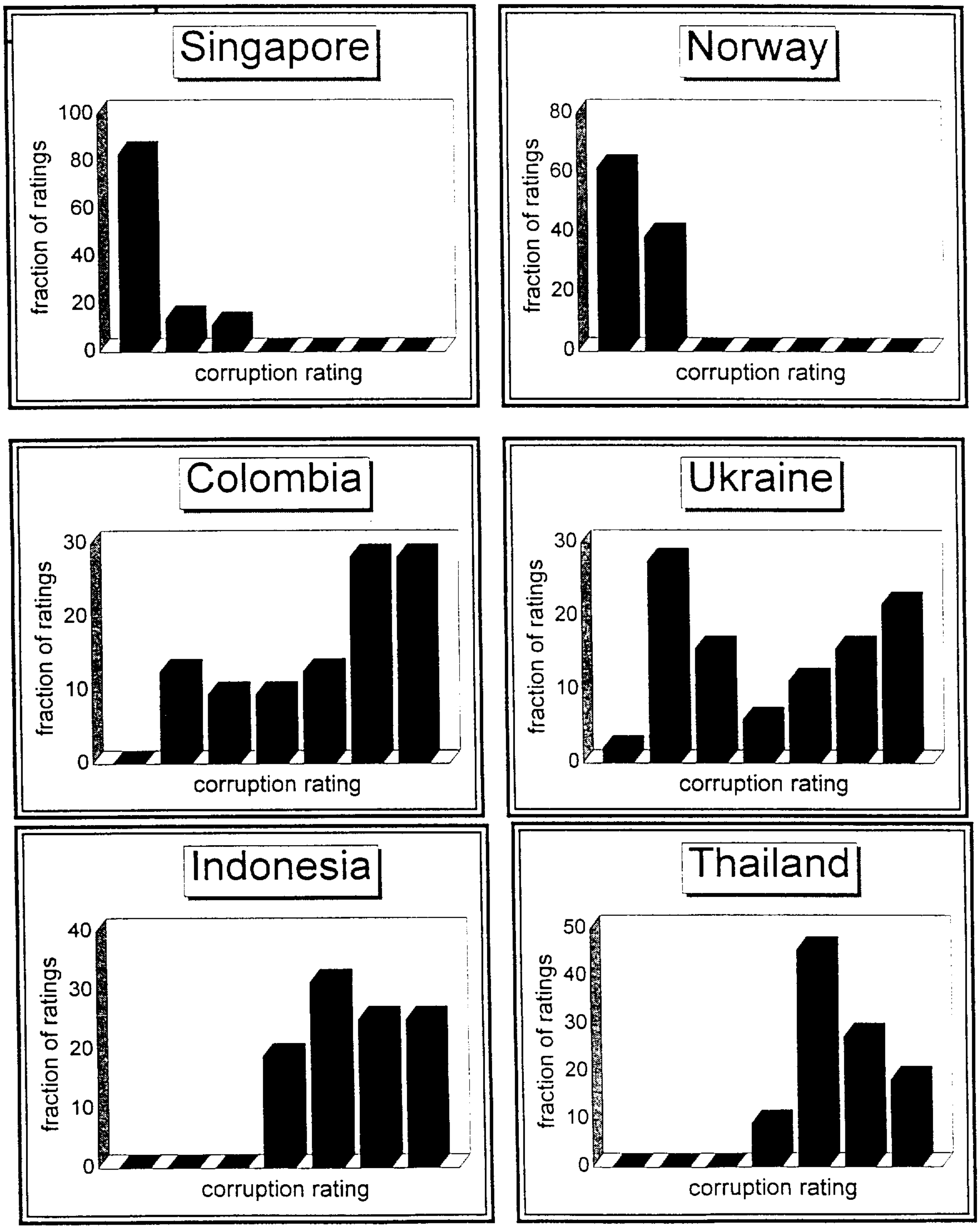

Figure 1: Empirical Density Functions of Corruption Ratings

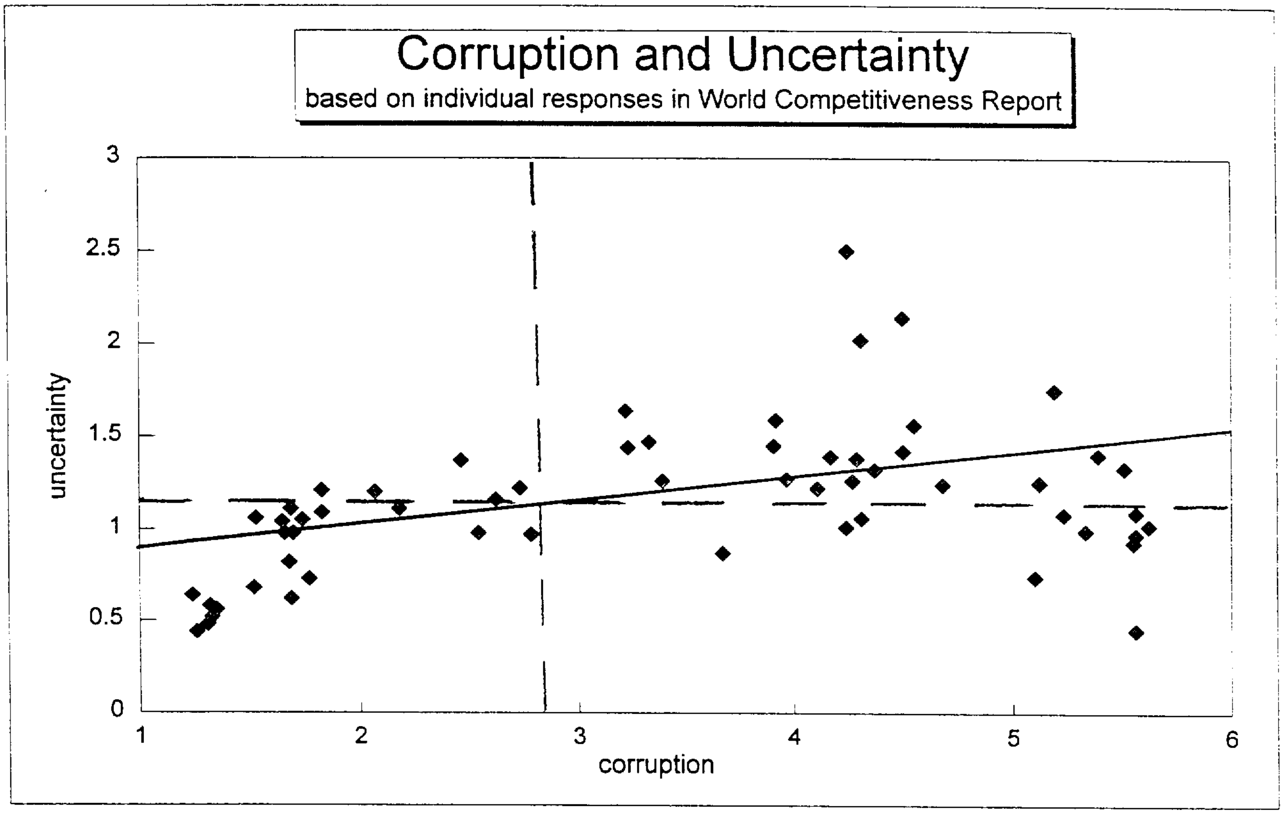

Figure 2: Uncertainty versus Average Corruption
(Based on GCR survey)

Table 1: Summary Statistics

	Mean	Stddev	Min	Max	Skewness	Kurtosis	#obs
Corruption							
BI-Index	3.70	2.49	1	10	0.75	-0.20	45
TI-Index	4.55	2.63	1	10	0.42	-1.02	42
W.C.R.	2.92	1.43	1.24	5.56	0.50	-1.24	41
Corruption-induced uncertainty							
Uncertainty	1.05	0.31	0.44	1.75	-0.11	-0.21	41
Others							
Tax	0.34	0.12	0.02	0.55	-0.69	0.42	45
Stability	7.93	1.17	5	10	-0.56	-0.31	45
Red Tape	4.34	2.30	1	9	0.15	-1.05	45

Pairwise Correlation Matrix
(40 observations)

	C(BI)	C(TI)	C(WCR)	Uncertainty	Tax	Stability
Corruption(BI)	1					
Corruption(TI)	0.88	1				
Corruption(WCR)	0.77	0.83	1			
Uncertainty	0.41	0.49	0.51	1		
Tax	0.20	0.28	0.30	0.24	1	
Political Stability	-0.69	-0.65	-0.69	-0.43	-0.11	1
Red Tape	0.88	0.85	0.79	0.43	0.33	-0.66

BI-Index = 11 - original BI-index score
TI-Index = 10 - original TI-index score
W.C.R. = 8 - original index
Red Tape = 11 - original index from BI

Table 2: Corruption-induced Uncertainty and FDI

(Modified Tobit, trimmed data, with continuously measured corruption and uncertainty)

Dependent variable: log(stock of FDI from i to j in 1991 + A)

Tax-rate	-1.92*	-1.65*	-1.62*	-1.42*
	(0.47)	(0.41)	(0.40)	(0.44)
Corruption	-0.09*	0.18*	0.18*	0.22*
(BI-index)	(0.02)	(0.07)	(0.07)	(0.07)
Uncertainty		-0.21*	-0.20*	-0.20*
X Corruption		(0.06)	(0.06)	(0.06)
Political			0.07	0.05
Stability			(0.05)	(0.05)
Red Tapes				-0.06
				(0.04)
log(GDP_j)	0.54*	0.52*	0.50*	0.50*
	(0.10)	(0.10)	(0.10)	(0.10)
log(Distance_ij)	-0.28*	-0.24*	-0.23*	-0.24*
	(0.06)	(0.06)	(0.05)	(0.06)
Linguistic	0.70*	0.65*	0.62*	0.60*
Tie	(0.28)	(0.26)	(0.25)	(0.24)
Constant	1.6E+4*	1.6E+4*	1.6E+4*	1.6E+4*
	(3.0)	(3.1)	(4.7)	(3.3)
A	6.3E+9*	6.9E+9*	7.1E+9*	7.1E+9*
	(6.4E+6)	(1.0E+7)	(2.7E+7)	(1.2E+7)
σ	1.16*	1.05*	1.02*	1.02*
	(0.18)	(0.16)	(0.16)	(0.16)
Source Dummies?	yes	yes	yes	yes
#obs	545	545	545	545
LogLikelihood	1789.32	1826.00	1836.18	1838.11

Notes:

(1) * and # denote significantly different from zero at the five and ten percent levels, respectively.

(2) Eicker-White standard errors that are computed from analytic first and second derivatives are in parentheses. All reported coefficients and standard errors have been multiplied by 10^3.

(3) "Corruption" and "Redtape" equal to 11 minus the corresponding BI-indexes, so that larger numbers mean more corruption or red tape. "Uncertainty" for a given country is the standard deviation of all individual ratings of that host country's corruption level in the 1997 Global Competitiveness Report.

Table 3: Adding Labor Market Variable

(Modified Tobit)

Dependent variable: log(stock of FDI from i to j in 1991 + A)		
Tax-rate	-1.56*	-1.53*
	(0.41)	(0.41)
Corruption	0.19*	0.19*
(BI-index)	(0.08)	(0.08)
Uncertainty	-0.17*	-0.18*
X Corruption	(0.07)	(0.07)
Political	0.07	0.07
Stability	(0.05)	(0.05)
Red Tapes	-0.12*	-0.14*
	(0.05)	(0.05)
log(GDP_j)	0.47*	0.48*
	(0.10)	(0.09)
log(Distance_ij)	-0.26*	-0.26*
	(0.06)	(0.06)
Linguistic	0.59*	0.59*
Tie	(0.22)	(0.22)
OECD	0.25*	0.42*
	(0.11)	(0.22)
log(Wage)	-0.27*	-0.25*
	(0.08)	(0.08)
log(Wage)		-0.09
X OECD		(0.09)
Constant	1.6E+4*	1.6E+4*
	(2.6)	(2.5)
A	8.2E+9*	8.2E+9*
	(5.4E+6)	(3.3E+6)
σ	0.91*	0.91*
	(0.14)	(0.14)
Source Dummies?	yes	yes
#obs	450	450
LogLikelihood	1626	1627

Table 4: Corruption-induced Uncertainty and FDI
(modified Tobit, with binary measures of corruption and uncertainty)

Dependent variable: log(stock of FDI from i to j in 1991 + A)				
Tax-rate	-5.88*	-7.52*	-7.81*	-5.61*
	(1.39)	(1.59)	(1.63)	(1.30)
H-Corruption (BI-index)	-0.48#	-0.06	0.58	1.74*
	(0.26)	(0.28)	(0.39)	(0.51)
H-Uncertainty X H-Corruption		-2.83*	-3.42*	-3.38*
		(0.68)	(0.76)	(0.68)
Political Stability			0.55*	0.12
			(0.15)	(0.12)
Red Tapes				-0.42*
				(0.12)
log(GDP_j)	1.51*	1.58*	1.58*	1.37*
	(0.29)	(0.30)	(0.30)	(0.25)
log(Distance_ij)	-0.80*	0.77*	-0.74*	-0.69*
	(0.16)	(0.16)	(0.16)	(0.14)
Linguistic Tie	1.98*	1.95*	1.78*	1.38*
	(0.77)	(0.75)	(0.74)	(0.60)
Constant	1.5E+4*	1.5E+4*	1.5E+4*	1.5E+4*
	(7.6)	(6.7)	(9.0)	(7.6)
A	2.2E+9*	2.4E+9*	2.3E+9*	2.8E+9*
	(1.4E+6)	(3.7E+6)	(3.6E+6)	(2.3E+6)
σ	3.06*	3.07*	3.09*	2.54*
	(0.48)	(0.48)	(0.48)	(0.40)
Source Dummies?	yes	yes	yes	yes
#obs	545	545	545	545
LogLikelihood	1432.72	1448.48	1450.84	1520.19

Notes:
(1) "Corruption" = 1 if the BI-index >3 and 0 otherwise. "Uncertainty" = 1 if the standard deviation defined in Footnote 3 of Table 2 exceeds 1.55, and zero otherwise. Larger numbers imply more corruption or greater uncertainty.
(2) Please also see footnotes to Table 2.

Table 5: Uncertainty and Flow of FDI
(Modified Tobit)

Dependent variable: log(flow of FDI from i to j over 1990-1991 + A)				
Tax-rate	-2.42* (0.51)	-2.27* (0.50)	-2.25* (0.49)	-2.06* (0.49)
Corruption (BI-index)	-0.12* (0.02)	0.15* (0.06)	0.15* (0.06)	0.17* (0.07)
Uncertainty X Corruption		-0.23* (0.06)	-0.24* (0.06)	-0.24* (0.06)
Political Stability			-0.05 (0.06)	-0.07 (0.05)
Red Tapes				-0.05 (0.05)
log(GDP_j)	0.47* (0.10)	0.49* (0.06)	0.49* (0.06)	0.49* (0.06)
log(Distance_ij)	-0.52* (0.06)	-0.49* (0.06)	-0.49* (0.06)	-0.50* (0.07)
Linguistic Tie	0.19 (0.28)	0.19 (0.18)	0.20 (0.18)	0.18 (0.18)
Constant	1.6E+4* (2.3)	1.4E+4* (1.6)	1.4E+4* (1.9)	1.4E+4* (1.6)
A	1.4E+9* (2.5E+6)	1.5E+9* (7.3E+5)	1.5E+9* (1.5E+6)	1.5E+9* (5.9E+5)
σ	1.02* (0.11)	1.01* (0.11)	1.02* (0.11)	1.00* (0.11)
Source Dummies?	yes	yes	yes	yes
#obs	518	518	518	518
LogLikelihood	1413.86	1420.53	1421.50	1423.97

Notes:
(1) Flow of FDI over 1990-91 = End of 1991 stock - End of 1989 stock.
(2) Please also see the footnotes to Table 2.