# Does Contract Risk Impede Foreign Direct Investment?

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## 1. INTRODUCTION

Flows of foreign direct investment (FDI) are typically explained by 'traditional' cost determinants, such as factor or trade costs (e.g. DUNNING, 1993; or CAVES, 1996). Recently, an increasing number of researchers views *risk factors* as an important impediment to inward FDI. In this discussion, special attention is devoted to the impact of exchange rate variability and demand uncertainty (e.g. GOLDBERG and KOLSTAD, 1995; AIZENMAN and MARION, 2001). So far, however, there is less evidence on the influence of institutional contracts-related risk factors, such as *contract inviability* or *corruption*. Where the former reflects an insufficient quality of a country's legal system, the latter emphasizes the misuse of power by public officials (see, e.g., SHLEIFER and VISHNY, 1993). Since both enter the risk-related cost of international investors, they are important obstacles for the international flow of FDI.[1] Whereas a recent theoretical paper points to a positive (long-run) impact of corruption on inward FDI (compare GLASS and WU, 2002), HINES (1995), for instance, has shown that US investors tend to locate their FDI

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1. In a somewhat different line of reasoning, some authors have shown that a binding legal system fosters economic growth (see, e.g., BARRO, 1991; ISLAM, 1995; GWARTNEY et AL., 1999; DE HAAN and STURM, 2000; and NELSON and SINGH, 1998, for evidence on less developed countries); in contrast, corruption has a negative impact on growth (see SHLEIFER and VISHNY, 1993; MAURO, 1995; EHRLICH and LUI, 1999). KAUFMAN et AL. (1999, 2002) have analyzed three dimensions of 'governance', namely "(1) the process by which governments are selected, monitored and replaced, (2) the capacity of the government to effectively formulate and implement sound policies, and (3) the respect of citizens and the state for the institutions that govern economic and social interactions among them." (KAUFMAN et AL. 1999, p. 1). Their findings suggest that governance has a significant impact on economic outcomes. Note that our study concentrates on contract-related risks, which are part of the third category of KAUFMAN et AL. (1999).

in less corrupt countries. WEI (1997), analyzing a cross-section of bilateral FDI from 14 source countries and 45 host economies in 1990 and 1991, has concluded that equalizing the corruption level of Singapore and Mexico would be equivalent to an increase of the tax rate by over twenty percentage points. More recently, ALESINA and WEDER (1999) have proved that corruption has a significant negative impact on FDI flows by regressing FDI on corruption in a large cross section of nations.[2]

This paper extends the previous empirical evidence in several directions. First, we estimate the effect of two important contract-risk related components on inward stocks of FDI: viability of contracts and the level of corruption. We presume that both are potentially important ingredients in foreign investment decisions: (i) A higher viability of contracts reduces the risk of losing both profits and sunk investments abroad, and we expect a positive impact on inward FDI. (ii) "Corruption is associated with an extra fee or bribe paid to a government official by a private entrepreneur for obtaining an economic profit" (GLASS and WU, 2002, p. 3). According to previous evidence, the negative impact of corruption on FDI dominates. In the long run, however, there are complicated general equilibrium effects at work, and "corruption need not be bad for FDI..." (GLASS and WU, 2002, p. 19).

Second, as the development of contract specific risk costs varies across nations, it should be related to the change in the international *distribution* of FDI. We take account of this argument by illustrating, how these two components of transaction costs influence the international distribution of FDI. Empirically, (i) we utilize a large panel of 50 (developed and less developed) host countries between 1985–1997, covering more than 90 % of the world's inward FDI, and (ii) we disentangle the short run and the long run impact of contract risk. Our results clearly support the hypothesis of a positive relationship between risk-related cost reducing factors and a host country's attractiveness for foreign investors.

Third, in a counterfactual simulation analysis we ask for two related questions: (i) What was the contribution to both the growth and the distribution of FDI according to the change in the perceived viability of contracts in the last decades? (ii) How would FDI change in course of an international 10 % reduction of perceived corruption? Our findings suggest that the contribution of the perceived viability of contracts was about 16 % of the observed overall FDI growth in our sample of countries. Further, the observed change in this variable has accounted for an *equalization effect* on the international distribution of real inward FDI stocks, which was mainly in favor of FDI stocks in the NAFTA and EU areas and mostly at the expense of FDI stocks in the rest of OECD and the Asian nations. Additionally, we find an *equalization effect* in our second experiment, a 10 % reduction in the perceived corruption in all countries of the sample. This effect is due to the fact that corruption is relatively pronounced in regions, which host a

2. HARMS and URSPRUNG (2002), in a slightly different notion, have focused on the impact of '*political freedom*' on inward FDI (similarly SCHNEIDER and FREY, 1985). Basically, their results suggest that an environment of generous human and individual rights attracts inward FDI.

relatively small stock of FDI. The 10 % reduction in perceived corruption favors predominantly Asia as well as the South and Central American economies at the expense of FDI in the EU and the NAFTA.

The remainder is organized as follows. Section 2 motivates our econometric specification and discusses the contract-related risk determinants as well as other controls. Further, this section elaborates the empirical model and discusses the key issues of estimation. Section 3 presents the empirical results and the findings of the simulation analysis. Finally, Section 4 concludes.

## 2. THE EMPIRICAL MODEL

In line with prior research, we claim that contract-related risk costs lower international investment activities. Therefore, a low level of contract risk may be seen as a locational advantage of a country, which, in turn, stimulates FDI inflows. Further, we expect that a change in contract risk affects the international distribution of FDI in favor of regions, where contract-related risk components decline relative to the others. To isolate the impact of contract risk on FDI, we follow the related literature and control for other determinants of the locational choice of horizontally (i.e. *market seeking*) and vertically (i.e. *low-cost seeking*) organized multinational enterprises.

**Contract Risk:** We focus on two components of contract risk, i.e. viability of contracts and corruption, and we apply rating based data as collected by the *Economic Freedom Network* (see GWARTNEY et AL., 1996, 2000)[3] and by TRANSPARENCY INTERNATIONAL (TI, 2001). Viability of contracts reflects the risk of contract repudiation by the government (see GWARTNEY et AL. 2000). The viability of contracts index is reported annually. On the other hand, the TI corruption index summarizes the degree to which corruption is perceived to exist among public officials. It is a composite index, drawing on 14 different polls and surveys from seven independent institutions carried out among business people and country analysts (see TRANSPARENCY INTERNATIONAL, 2001, for further details). Since Transparency International does not publish a corruption index for the whole period 1985–1997, we apply the 1997 index to exploit the cross-sectional dimension of corruption.

Both variables take values in between 0 and 10, where 0 corresponds to a very high level of contract risk. According to our above reasoning, we expect a positive impact of a reduction in contract risk in any of the two variables on FDI. It should be noted, how-

3. An alternative measure is assembled by the *Heritage Foundation* (see JOHNSON et AL. 1998). According to DE HAAN and STURM (2000, p. 223–226) both data collections are similar with respect to their country ratings. In our study, we refer to the Economic Freedom Network since it obtains data for a longer time period. Further we only apply the institutional components of the freedom index. Thus, other areas mainly covering macroeconomic aspects (for instance, money supply, inflation rate, or capital controls) are not used here (for details see GWARTNEY et AL. 2000).

ever, that to some extent this squares with the hypothesis of a positive relationship between FDI and corruption as stated by GLASS and WU (2002).

**Other Controls:** First, the theoretical literature on horizontally organized multinationals stresses the importance of the proximity to the market (see BRAINARD, 1993). Accordingly, multinational activity abroad is driven by the market size of destination countries. We follow the related empirical literature and use country size in terms of GNP as a proxy for foreign market size (compare BRAINARD, 1997; MARKUSEN and MASKUS, 1999).[4] We expect a positive impact of an increase in market size on inward FDI. Second, vertical multinational activity and FDI is predominantly determined by differences in relative factor endowments rather than size. Since the developed economies (i.e., the OECD countries) are the main sending countries of FDI, we would expect more vertical FDI to flow into countries with a low high-skilled to low-skilled labor ratio (proxied by secondary school enrolment figures), and more horizontal FDI in the opposite case (see also MARKUSEN and MASKUS, 1999; and WHEELER and MODY, 1992). Third, the literature on the determinants of bilateral FDI underpins the negative impact of distance as a measure of transaction costs on FDI (see MARKUSEN and MASKUS, 1999; EGGER and PFAFFERMAYR, 2003; and BLONIGEN et AL., 2002). We account for this by using the average distance (weighted by the market size of all other economies in the sample; see below for further details). In the context of *horizontal* multinationals, we would expect a positive impact of distance on FDI, since distance reflects transportation costs that discourage exporters. In contrast, MARKUSEN and MASKUS (1999) emphasize the complementarity of exports and *vertical* FDI with respect to transport costs (i.e. distance). From the latter perspective, distance should exhibit a negative impact on FDI.

**Specification:** We estimate the impact of contract risk on inward FDI at the aggregate level in an error components framework (see BALTAGI, 2001, for further details). To isolate this effect, we control for the most important determinants of FDI as outlined before:

$$\begin{aligned}\log F_{it} = {} & \beta_0 + \beta_1 V_{it} + \beta_2 \log G_{i(t-1)} + \beta_3 \log S_{it} + \beta_4 R_{it} + \lambda_t \\ & + \pi_1 V_{i.} + \pi_2 C_i + \pi_3 \log G_{i.} + \pi_4 \log S_{i.} + \pi_5 R_{i.} + \pi_{\lambda_t} + u_{it},\end{aligned} \tag{1}$$

where $F$ denotes a country $i$'s real inward stocks of FDI in year $t$. $G$ is real GNP in terms of 1995 US$, $S$ is the secondary school enrolment share, $R$ is the country's population weighted distance from the world's most important markets. $0 \leq V \leq 10$ denotes viability of contracts (0 corresponds to a very low level of contract viability and 10 to the highest possible level), and $0 \leq C \leq 10$ is the corruption index scoring, ranging from 0 (highly corrupt) to 10 (very clean). The data sources are explained below. $\lambda_t$ denotes

4. CAVES (1996, p. 29–30) emphasizes that "another consequence of scale economies is that where the MNE locates its production depends... also on the sizes of... national markets."

fixed time effects and accounts for unobserved time-specific influences common to all countries in the sample, such as the international business cycle.

**Estimation:** According to MUNDLAK (1978), the time-variant variables are included twice, once in their original form and once averaged over time (denoted by subscript '.' instead of '$t$').[5] $u_{it}$ is a random error term and consists of two parts, $\mu_i$ and $\varepsilon_{it}$. The former represents all additional, unobserved, random country specific effects (such as other time-invariant other risk factors) and $\varepsilon_{it}$ is the classical remainder error term.

GLS on (1) obtains both the within effects ($\beta$) and the additional between (between minus within) effects ($\pi$, see MUNDLAK, 1978). In the presence of adjustment costs, (1) should be estimated by including a lagged dependent variable (e.g. BALTAGI, 2001, for further details on dynamic panel models). However, our data structure does not allow for the sound estimation of a dynamic model, notably due to the short average time dimension and the unbalanced data. PIROTTE (1999) formally demonstrates that the static within and between effects provide close approximations to the short run and long run effects. We follow this suggestion and interpret the $\beta$-coefficients as an approximation of the short run effects and the $\pi$-coefficients as an approximation of their additional long run (long run minus short run) counterparts.

## 3. DATA AND ESTIMATION RESULTS

**Data Sources:** We approximate real stocks of FDI ($F$) in the following way. Nominal stocks in US$ from UNCTAD's World Investment Indicators are depreciated by investment deflators to come up with real stocks in the initial period. We choose 1995 as the base year. Further, we assume a constant depreciation rate of $100 \times \delta = 8\,\%$ throughout (see KELLER, 2000, p. 41 for a justification of this assumption). Real FDI stocks in the following periods are then defined as

$$F_t = F_{t-1}(1 - \delta) + FI_t, \tag{2}$$

where $FI_t$ is real direct investment in year $t$.

Viability of contracts ($V$) is taken from the ECONOMIC FREEDOM NETWORK (2001); the corruption index ($C$) is provided by TRANSPARENCY INTERNATIONAL (2001). GDP ($G$) and secondary school enrolment ($S$) come from the World Bank's World Development Indicators. Finally, remoteness ($R$) is measured as the population weighted greater circle distance from the other 49 economies in the sample, which are the world's most important markets:

5. The additional between estimates of the time effects are included as well ($\pi_{\lambda_t}$). Their coefficients are different from zero in our application, since the data set is unbalanced.

$$R_{it} = \frac{\sum_j N_{jt} d_{ij}}{\sum_j N_{jt}}, \tag{3}$$

where $N_{jt}$ denotes the population of partner country $j$ at time $t$, and $d_{ij}$ is the outer circle distance between country $i$ and $j$ (see EGGER, 2000, for details).[6]

**Descriptive Statistics:** Table 1 summarizes the descriptive statistics. The EU and the NAFTA together account for more than 65 % of real stocks of FDI in the whole sample of 50 countries covering the period 1985–1997. With respect to the viability of contracts it turns out that the EFTA countries exhibit the highest values, whereas the lowest ones are observed in the CEEC as well as the South and Central American countries. Further, the EFTA and the EU countries remain the economies with lowest perceived corruption (highest scoring); on the other hand, economies with the lowest corruption index, i.e. the highest perceived corruption, are the African, South and Central American as well as the Asian ones.

**Table 1: Descriptive statistics**

| Country bloc | Real FDI stocks Share in final period in % | Viability of contracts Average score in final period | Corruption index Average score 1997 (constant) |
|---|---|---|---|
| EU | 36.9 | 9.3 | 7.7 |
| EFTA | 3.0 | 10.0 | 8.7 |
| CEEC | 0.7 | 6.5 | 4.6 |
| NAFTA | 28.2 | 8.1 | 6.5 |
| OECD-Rest | 6.9 | 9.3 | 6.4 |
| Africa | 1.3 | 7.8 | 2.9 |
| South and Central America | 7.7 | 6.5 | 3.3 |
| Asia | 15.2 | 7.6 | 3.7 |
| Total | 100.0 | 8.2 | 5.5 |

**Regression results:** The data set is unbalanced, where the length of the time series varies considerably across nations. In sum, we come up with 324 and 290 observations, respectively. We run GLS on (1) using all non-missing FDI data in our sample. Table 2 presents the results.

6. One might claim that GDP or GNP would be more suitable weights. However, the correlation coefficient between the population weighted and the (real) GDP weighted remoteness variable is about 0.87. Besides, using the GDP weighted remoteness changes only the respective coefficient but leaves the other estimates unaffected. We also have checked the sensitivity of our results with respect to the simple average distance instead of the weighted one. The results in Table 2 below are robust with respect to this alternative measure. Results are available from the authors upon request.

**Table 2: The Impact of Contract Risk on FDI Stocks**

| Explaining variable[a] | Model (A) Mundlak | Model (B)[b] Mundlak; no outliers | Model (C) Mundlak AR(1) | Model (D)[b] Mundlak AR(1); no outliers |
|---|---|---|---|---|
| | Short run effects (within estimates) | | | |
| Viability of contracts | 0.144*** | 0.115*** | 0.074 | 0.093*** |
| | (0.043) | (0.025) | (0.052) | (0.029) |
| Log lagged real GDP | −0.724** | −0.415* | −0.543 | −0.390* |
| | (0.345) | (0.220) | (0.389) | (0.235) |
| Log secondary school enrollment share | 0.240 | 0.229 | 0.100 | 0.175 |
| | (0.390) | (0.242) | (0.487) | (0.286) |
| Log remoteness | −3.867 | −11.068* | −4.651 | −11.405 |
| | (10.479) | (6.360) | (15.020) | (8.185) |
| | Additional long run effects (between − within estimates) | | | |
| Viability of contracts | −0.205 | −0.192 | −0.154 | −0.183 |
| | (0.130) | (0.118) | (0.132) | (0.116) |
| Corruption (1997) | 0.272** | 0.260** | 0.293** | 0.260** |
| | (0.114) | (0.107) | (0.115) | (0.105) |
| Log lagged real GDP | 1.674*** | 1.369*** | 1.476*** | 1.350*** |
| | (0.360) | (0.240) | (0.402) | (0.253) |
| Log secondary school enrollment share | −1.294 | −1.100 | −1.110 | −0.986 |
| | (0.835) | (0.748) | (0.885) | (0.745) |
| Log remoteness | 4.818 | 11.960* | 5.645 | 12.354 |
| | (10.500) | (6.395) | (15.025) | (8.210) |
| Observations | 324 | 290 | 324 | 290 |
| Cross sections | 50 | 49 | 50 | 49 |
| $R^2$ | 0.998 | 0.999 | 0.999 | 0.999 |
| Time effects: $\chi^2(13)$ | 39.78*** | 66.27*** | 38.27*** | 59.69*** |
| Shapiro-Wilk W test for normal data | 7.67*** | 1.19 | 7.71*** | 0.95 |
| Estimated autocorrelation coefficient: $\rho$ | | | 0.80 | 0.69 |
| Bhargava et al. (1984) modified Durbin Watson | | | 0.69*** | 1.71*** |

Notes: a) Constant and time effects not reported for the sake of brevity. b) Observations with errors within the 95% and the 5% percentile are excluded. Standard errors in parentheses. *** significant at 1%; ** significant at 5%; * significant at 10%.

In general, the model fit is well and the results for the coefficients of the risk related factors are fairly robust with respect to the correction for both outliers and AR(1) residuals (Models C to D; see below for more details). In all models, the estimated short run effect of a change in the viability of contracts amounts to about 0.1. The additional long run effect, however, is insignificant. Hence, an increase in the average country's viability of contracts score by one point results in an overall shift in FDI by about $100 \cdot (\exp(0.1) - 1) = 10\%$. Similarly, the (long run) estimate of the corruption index is stable among the specifications and amounts to about 0.25. Hence, an additional

score in the corruption index (i.e. less corruption) implies a long run impact of about 100 $(\exp(0.25) - 1) = 28\%$ in the average country's inward FDI stocks. Note, that this result is in line with the prior empirical evidence (see HINES, 1995; WEI, 1997; and ALESINA and WEDER, 1999) but contrast to GLASS and WU (2002).

Country size (GDP) exhibits a positive overall impact, as expected (see CAVES, 1996). Further and in line with MARKUSEN and MASKUS (1999), the coefficient of remoteness (i.e. the average distance from relevant markets) clearly indicates a negative short run impact. However, remoteness seems to be irrelevant in the long run.[7] Surprisingly, we cannot identify any significant impact of the secondary school enrolment ratio. This might have to do with the dominance of vertical FDI in the sample at hand. Vertically organized multinationals do their high-skilled labor intensive production and research in the developed countries and produce low-skilled labor intensive in countries, where labor costs are low (see CAVES, 1996).[8]

**Robustness:** We undertake several robustness checks. First, we examine the sensitivity of our results with respect to outliers (Models B and D). These exclude all observations with a remainder error in the upper or lower end 5 percentile range (in sum, 34 observations or about 10 % of the sample). Noteworthy, this also obtains residuals, where the hypothesis of their normal distribution cannot be rejected (compare the Shapiro-Wilk W test statistics of Models B and D in Table 2).

Second, we perform GLS AR(1) regressions in the spirit of BALTAGI and WU (1999) to account for autoregressive residuals and unequally spaced data (Models C and D). We identify a substantial autocorrelation parameter of 0.87 (0.7 without outliers). Therefore, we argue that the short run estimate of the viability of contracts ($\beta_4$) forms only a lower bound estimate.[9]

Third, performing a jackknife analysis (see EFRON and TIBSHIRANI, 1993) on Model D we identify the most influential countries with respect to maximum changes in the coefficients of the two coefficients of interest (see Table 3): viability of contracts (short run: $\beta_4$) and corruption (long run: $\pi_5$). The minimum (maximum) of the former amounts to 0.048 (0.079) and it is driven by the exclusion of China (Egypt). The minimum (maximum) of the latter is 0.143 (0.293) and is caused by the exclusion of Saudi-Arabia (Egypt). Nevertheless, neither of the two coefficients changes its sign and the estimated average lies in the center of the two identified extreme bounds.

7. If one uses the simple average distance instead of the weighted one, one obtains an insignificant coefficient as well.
8. To account for the coexistence of horizontal and vertical FDI, MARKUSEN and MASKUS (1999) suggest to include an interaction term between country size and the bilateral difference in the endowment with skilled labor. In our context, this boils down to an interaction term between GDP and secondary school enrolment. However, the corresponding parameter estimate is not significant.
9. EGGER and PFAFFERMAYR (2002) demonstrate that a stronger dynamic process leads to an underestimation of the short run effects by the within estimator.

**Table 3: Jackknife Analysis**

| Explanatory variables | Minimum coefficient Parameter | Country | Point estimate Parameter | Maximum coefficient Parameter | Country |
|---|---|---|---|---|---|
| Viability of contracts | 0.078 | China | 0.093 | 0.108 | Egypt |
| Log lagged real GDP | −0.469 | China | −0.390 | −0.276 | Bulgaria |
| Log secondary school enrollment share | 0.099 | China | 0.175 | 0.419 | Australia |
| Log remoteness | −15.399 | Indonesia | −11.405 | −5.377 | India |
| Mean viability of contracts | −0.228 | Indonesia | −0.183 | 0.066 | Saudi-Arabia |
| Corruption (1997) | 0.157 | Saudi-Arabia | 0.260 | 0.312 | Egypt |
| Mean log lagged real GDP | 1.205 | Bulgaria | 1.350 | 1.455 | Japan |
| Mean log secondary school enrollment share | −1.365 | India | −0.986 | −0.453 | Singapore |
| Mean log remoteness | 6.028 | India | 12.354 | 16.235 | Indonesia |

**Table 4: The Impact of Contract Risk on FDI Stocks. Accounting for Rule of Law**

| Explaining variable[a] | Model (A) Mundlak | Model (B)[b] Mundlak; no outliers | Model (C) Mundlak AR(1) | Model (D)[b] Mundlak AR(1); no outliers |
|---|---|---|---|---|
| | Short run effects (within estimates) | | | |
| Rule of Law | −0.006 | 0.011 | −0.008 | −0.003 |
| | −(0.017) | −(0.009) | −(0.014) | −(0.008) |
| Viability of contracts | 0.145*** | 0.111*** | 0.075 | 0.094*** |
| | −(0.043) | −(0.025) | −(0.052) | −(0.030) |
| Log lagged real GDP | −0.720** | −0.313 | −0.532 | −0.317 |
| | −(0.346) | −(0.226) | −(0.391) | −(0.237) |
| Log secondary school enrollment share | 0.239 | 0.192 | 0.093 | 0.144 |
| | −(0.391) | −(0.249) | −(0.489) | −(0.290) |
| Log remoteness | −3.539 | −7.671 | −4.564 | −6.679 |
| | −(10.536) | −(6.990) | −(15.112) | −(8.825) |
| | Additional long run effects (between − within estimates) | | | |
| Rule of Law | −0.055 | −0.073 | −0.072 | −0.074 |
| | −(0.084) | −(0.066) | −(0.086) | −(0.073) |
| Viability of contracts | −0.183 | −0.166 | −0.125 | −0.156 |
| | −(0.134) | −(0.104) | −(0.136) | −(0.115) |
| Corruption (1997) | 0.311** | 0.298*** | 0.343*** | 0.308*** |
| | −(0.126) | −(0.100) | −(0.126) | −(0.110) |
| Log lagged real GDP | 1.656*** | 1.255*** | 1.445*** | 1.263*** |
| | −(0.361) | −(0.241) | −(0.404) | −(0.254) |
| Log secondary school enrollment share | −1.276 | −1.049 | −1.083 | −0.946 |
| | −(0.840) | −(0.648) | −(0.883) | −(0.720) |
| Log remoteness | 4.383 | 8.442 | 5.423 | 7.472 |
| | −(10.559) | −(7.018) | −(15.112) | −(8.853) |
| Observations | 324 | 290 | 324 | 290 |
| Cross sections | 50 | 49 | 50 | 49 |
| $R^2$ | 0.998 | 0.999 | 0.997 | 0.999 |

Notes: a) Constant and time effects not reported for the sake of brevity. b) Observations with errors within the 95 % and the 5 % percentile are excluded. Standard errors in parentheses. *** significant at 1 %; ** significant at 5 %; * significant at 10 %.

Fourth, we include *rule of law* as an additional determinant of contract-risk as reported by the Economic Freedom Network. According to GWARTNEY et AL. (2000), this variable measures the quality of legal institutions, including the access to a non-discriminatory judiciary. Again, this index can take values in between 0 and 10, where a higher range reflects a higher level of legal quality. As Table 4 indicates, this variable does not account for any additional significant impact on FDI, and our previous results are robust with respect to the inclusion of the rule of law index.[10]

**Table 5: The Impact of Contract Risk on FDI Stocks. Using the World Bank's 2000/01 Corruption Index**

| Explaining variable[a)] | Model (A) Mundlak | Model (B)[b)] Mundlak; no outliers | Model (C) Mundlak AR(1) | Model (D)[b)] Mundlak AR(1); no outliers |
|---|---|---|---|---|
| | Short run effects (within estimates) | | | |
| Viability of contracts | 0.144*** | 0.124*** | 0.076 | 0.110*** |
| | -(0.043) | -(0.024) | -(0.052) | -(0.030) |
| Log lagged real GDP | -0.724** | -0.275 | -0.537 | -0.314 |
| | -(0.345) | -(0.217) | -(0.389) | -(0.235) |
| Log secondary school enrollment share | 0.240 | 0.235 | 0.083 | 0.205 |
| | -(0.390) | -(0.239) | -(0.487) | -(0.287) |
| Log remoteness | -3.867 | -5.793 | -4.203 | -5.314 |
| | -(10.479) | -(6.694) | -(15.017) | -(8.651) |
| | Additional long run effects (between - within estimates) | | | |
| Viability of contracts | -0.192 | -0.199* | -0.134 | -0.194* |
| | -(0.126) | -(0.112) | -(0.130) | -(0.109) |
| Corruption (2000/01) | 0.614** | 0.607*** | 0.628** | 0.595*** |
| | -(0.249) | -(0.228) | -(0.253) | -(0.220) |
| Log lagged real GDP | 1.691*** | 1.252*** | 1.486*** | 1.298*** |
| | -(0.360) | -(0.236) | -(0.402) | -(0.252) |
| Log secondary school enrollment share | -0.965 | -0.804 | -0.700 | -0.715 |
| | -(0.767) | -(0.658) | -(0.820) | -(0.656) |
| Log remoteness | 4.811 | 6.656 | 5.216 | 6.231 |
| | -(10.500) | -(6.726) | -(15.023) | -(8.679) |
| Observations | 324 | 290 | 324 | 290 |
| Cross sections | 50 | 49 | 50 | 49 |
| $R^2$ | 0.998 | 0.999 | 0.997 | 0.999 |

Notes: a) Constant and time effects not reported for the sake of brevity. b) Observations with errors within the 95% and the 5% percentile are excluded. Standard errors in parentheses. *** significant at 1%; ** significant at 5%; * significant at 10%.

10. Additionally, we have checked for the relevance of the legal security of private ownership rights (risk of confiscation) as published by the Economic Freedom Network. However, this variable is highly collinear with the included viability of contracts measure. The corresponding Spearman rank correlation coefficient between the two variables amounts to 0.85, which precludes a simultaneous inclusion of both determinants.

Fifth, we assess the sensitivity of our results with respect to an alternative corruption index. Therefore, we apply the World Bank's 2000/01 index as reported in KAUFMANN et AL. (2002). KAUFMANN et AL. (1999) provide a detailed methodological discussion of this and alternative indices. As Table 5 indicates, the World Bank's index suggests an even higher influence of corruption on FDI, whereas the other results are almost unchanged.

**Table 6: The Impact of Contract Risk on FDI Stocks. Using time series of TI Corruption Index (1985–1997)**

| Explaining variable[a] | Model (B)[b] Mundlak; no outliers | Model (D)[b] Mundlak AR(1); no outliers |
|---|---|---|
| | Short run effects (within estimates) | |
| Viability of contracts | 0.121*** | 0.129** |
| | (0.025) | (0.059) |
| Corruption | −0.118*** | −0.070 |
| | (0.037) | (0.071) |
| Log lagged real GDP | −0.439* | 0.376 |
| | (0.260) | (0.697) |
| Log secondary school enrollment share | 0.406* | 0.919# |
| | (0.226) | (0.589) |
| Log remoteness | −8.708 | 39.324# |
| | (7.132) | (25.679) |
| | Additional long run effects (between – within estimates) | |
| Viability of contracts | 0.157 | 0.138 |
| | (0.188) | (0.106) |
| Corruption | 0.184* | 0.111 |
| | (0.111) | (0.153) |
| Log lagged real GDP | 1.104*** | 0.429 |
| | (0.286) | (0.706) |
| Log secondary school enrollment share | −0.680 | −1.508* |
| | (0.714) | (0.813) |
| Log remoteness | 9.141 | −38.359# |
| | (7.168) | (25.675) |
| Observations | 241 | 142 |
| Cross sections | 40 | 38 |
| $R^2$ | 0.999 | 0.999 |

Notes: a) Constant and time effects not reported for the sake of brevity. b) Observations with errors within the 95 % and the 5 % percentile are excluded. Standard errors in parentheses. *** significant at 1 %; ** significant at 5 %; * significant at 10 %; # significant at 15 %.

Sixth, to account for the time variation of corruption we re-estimate (1) using the TI index from 1985 to 1997. To obtain annual data between 1983 and 1995, we interpolate the TI index, since for 1980/85 and 1988/92 only averages are available. This, additionally, allows to disentangle the short and long run impact of corruption on FDI. Table 6 re-

ports the results for Models B and D. Accounting for the time variation of the TI index leaves our previous results almost unaffected, in particular with respect to viability of contracts. The negative (and in Model B significant) short run coefficient of corruption suggests a *positive* relationship between corruption and FDI. In contrast, the overall long run relationship is *negative*. However, the results of Table 6 should be interpreted cautiously, since (i) the TI data before 1995 are less precise and not directly comparable to the TI indices after 1995, (ii) the annual data before 1995 are interpolated, (iii) Model D in Table 5 is estimated with only 142 observations, and (iv) it should be emphasized that additional potentially relevant controls (such as labor market conditions, expectations about market growth, etc.) are not included for reasons of data availability.

Finally, we undertake a Monte Carlo exercise on our corruption index as applied in Table 2, which takes the imprecision of the reported point estimates of the corruption index into account (compare KAUFMAN et AL., 1999, p. 10, on this issue). Therefore, we randomly draw 1000 observations from each country's distribution of the 1997 TI corruption index. Since higher moments (skewness, kurtosis) are not available, we have to assume that the underlying distribution the reported standard errors refer to is normal. Using again Model D, we come up with the finding, that our result of a negative long run influence of corruption on FDI is (marginally) significant at $\alpha = 0.14$.

**Simulation Analysis:** With these sound regression results of Table 2 at hand, we are able to investigate the impact of the observed change in viability of contracts and an assumed 10 % reduction of each country's gap between its corruption index scoring and the optimum (score 10) on both the growth and the cross-country distribution of real stocks of FDI. For this purpose, we use the (lower bound) estimates of our preferred Model D.

We can assess the impact of the observed change in the perceived viability of contracts on real stocks of FDI from a growth accounting-like exercise. The first experiment assumes that the perceived viability of contracts had not changed since the initial period (counterfactual), all other determinants as observed. The difference can be viewed as the pure viability of contracts impact on real FDI stocks. According to Model D, this change accounts for about 16 % of the overall predicted growth of FDI in the whole sample.

We can assess the impact on the change in the country structure of real FDI stocks on the basis of this difference between predicted and counterfactual FDI stocks. Figure 1 summarizes the results.

Obviously, the change in perceived contract viability mainly has favored FDI stocks in the NAFTA and EU areas, mostly at the expense of FDI stocks in the rest of OECD and the Asian economies. In sum, the observed change in the perceived viability of contracts had an *equalization effect* on the international distribution of real inward FDI stocks. The change in the contract viability alone accounts for a 45 % increase in the entropy index[11] of the distribution of FDI stocks across country blocs.

11. Defined as $E = -\sum_i^n s_i \log s_i$, with $s_i$ as country bloc $i$'s share in overall stocks of inward FDI. $E$ exhibits its maximum with equally distributed shares.

**Figure 1: Short run impact of observed change in viability of contracts on inward FDI shares**

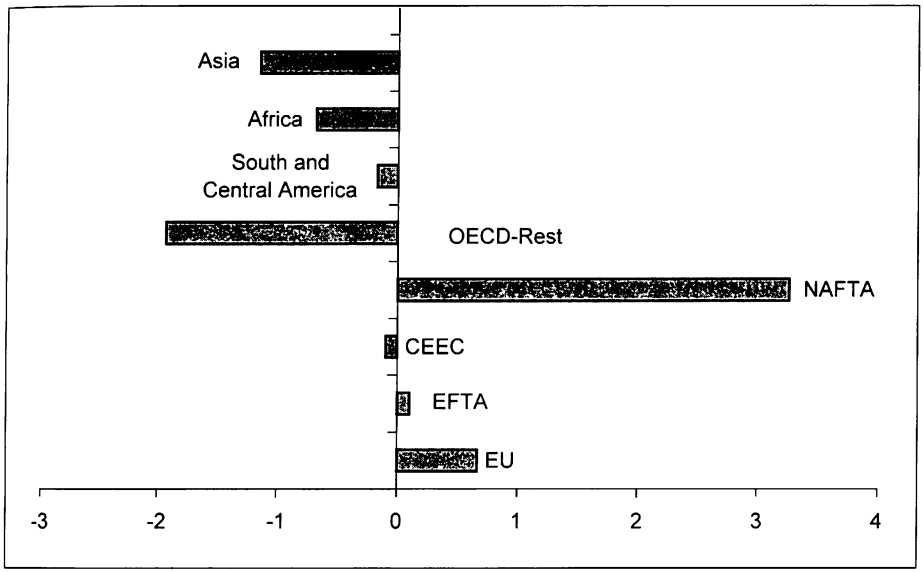


**Figure 2: Long run impact of a 10 % reduction in corruption on inward FDI shares**

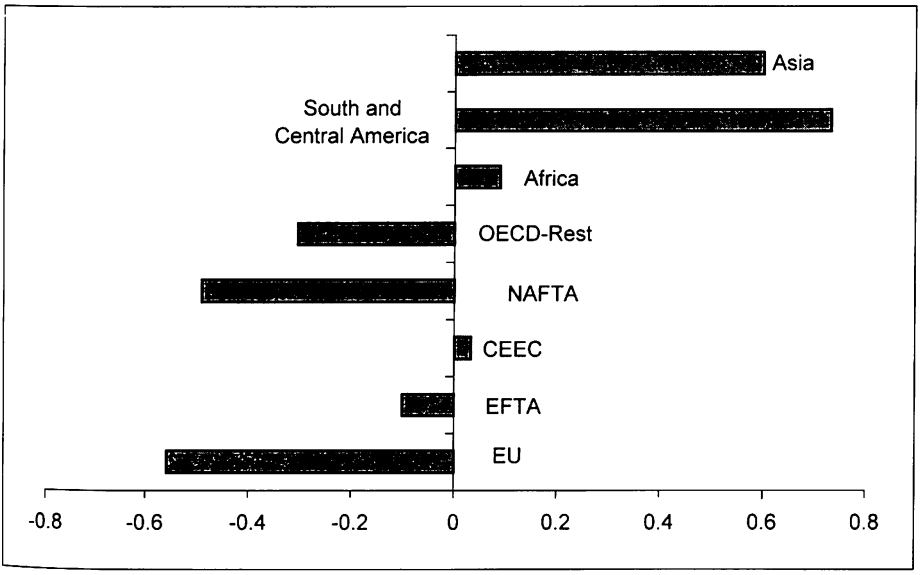

Figure 2 summarizes the result of the second experiment, i.e. closing the gap between the perceived corruption level and the optimal level (score 10) by 10%. Again, we focus on the impact of the observed minus counterfactual scenario difference (i.e. the corruption-only effect) on the cross-bloc structure of inward FDI. This causes an 249% increase in the entropy index, i.e. an enormous *equalization effect*. According to our simulation, this favors predominantly the Asian and the South and Central American economies. The involved redistribution of FDI stock shares would be mainly at the expense of the EU and the NAFTA.

In sum, a reduction in contract risk in terms of a larger perceived viability of contracts and a reduction of perceived corruption in the developing economies could substantially help these countries to attract more direct investment from the developed world. Since FDI is known as an important means of spillovers and an engine of growth (see, e.g., DE MELLO, 1999), the further development of the legal system and the pressure on corruptive structures could form an important contribution to these countries' catching up.

## 4. CONCLUSIONS

The empirical literature of the impact of contract risk on the flows of foreign direct investment is still scarce. This paper tries to analyze the importance of risk-related determinants on inward FDI, where the former is measured in terms of viability of contracts and corruption. In a data set of 50 developed and less developed countries, we find a positive short run impact for the viability of contracts. In sum, an additional score of contract viability induces an increase of inflow FDI by about 10%; similarly, the long run effect of corruption is equal to 28%.

In a thought experiment we asked for the effects on FDI if the world were 'freer' in terms of contract viability and corruption. It turns out that the contribution to FDI growth of the perceived viability of contracts was about 16% of the observed overall FDI growth between 1985 and 1997. Further, the observed change in this variable has accounted for an *equalization effect* on the international distribution of real inward FDI stocks, which was mainly in favor of FDI stocks in the NAFTA and EU areas and mostly at the expense of FDI stocks in the rest of the OECD and the Asian nations. Moreover, we find a strong *equalization effect* in our second thought experiment, a 10% reduction in the perceived corruption, which favors predominantly Asia as well as the South and Central American economies at the expense of FDI in the EU and the NAFTA.

Summing up, our evidence suggests that the reduction in contract risk is not only able to explain part of the *growth* of FDI but also the change of its worldwide *distribution*. From the perspective of the developing countries, it would be important to foster a policy that reduces contract risk in order to attract international investors.

## APPENDIX

*Country Sample*

**EU:** Austria, Denmark, Finland, France, Germany, Great Britain, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden.
**EFTA:** Iceland, Norway, Switzerland.
**CEEC:** Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovak Republic.
**NAFTA:** Canada, Mexico, USA.
**Rest of OECD:** Australia, Japan, New Zealand, South Korea, Turkey.
**Africa:** Algeria, Egypt, Morocco, South Africa.
**Asia:** China, Hong Kong, India, Indonesia, Kuwait, Malaysia, Philippines, Saudi Arabia, Singapore, Thailand.
**South and Central America:** Argentina, Brazil, Chile, Colombia, Panama, Venezuela.

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## SUMMARY

This paper analyzes the impact of contract-related risk factors on inward foreign direct investment. We presume that risk related determinants enter directly the cost function of multinationals. For a sample of 50 developed and less developed countries and the time period 1985–1997 we find a clear negative relationship between contract risk and FDI. Further, a simulation analysis reveals that the observed change in contract risk has equalized the international distribution of inward foreign direct investment.

## ZUSAMMENFASSUNG

Dieser Beitrag untersucht den Zusammenhang zwischen Kontraktrisiken und Direktinvestitionsbeständen im Inland (inward FDI). Die zugrunde liegende Vermutung ist, dass Kontraktrisiken einen Kostenfaktor von multinationalen Unternehmen darstellen und damit negativ auf FDI wirken. Diese Hypothese wird in einer Panelanalyse mit 50 Entwicklungs- und Industrieländern im Zeitraum 1985 bis 1997 untersucht. Die empirischen Ergebnisse bestätigen die Hypothese eines negativen Zusammenhangs zwischen Kontraktrisiken und FDI. Im Rahmen einer Simulationsanalyse wird ferner gezeigt, dass die (beobachtete) Veränderung der Kontraktrisiken eine Nivellierung der internationalen FDI-Stock Anteile bewirkt hat.



## RÉSUMÉ

Le but de cet article est de tester l'effet des risques de contrat sur les investissements directs étrangers (FDI). Nous partons du principe que les risques de contrat se répercutent négativement sur les frais des multinationales, et ainsi sur les FDI. Nous vérifions cette hypothèse en utilisant les données de panel de 50 pays pour la période de 1985 à 1997. Les résultats empiriques confirment l'effet négatif des risques de contrat sur les FDI. Une simulation indique que la modification des risques de contrat dans les deux dernières décades a nivelé les FDI entre les pays considérés.