Asymmetric influence of corruption distance on FDI

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Abstract

Purpose – The purpose of this paper is to measure the influence of corruption distance (CD) on foreign direct investment (FDI) with the characteristics of the value function from the Prospect Theory (PT) such as loss aversion and diminishing sensitivity.

Design/methodology/approach – Data are derived from Transparency International and the Organisation for Economic Co-operation and Development (OECD) and tested on the countries China, Germany, Italy, Japan, Korea, Russia, Spain and the UK and are analysed with a natural log (LN) regression model.

Findings – The findings indicate a negative asymmetric relationship for China, Germany, Korea, Spain and Russia. This means that negative performance on CD will not have greater impact on FDI outflows than positive performance on CD in the same country. Loss aversion, as well as diminishing sensitivity, as suggested by the PT, cannot be supported with the empirical results.

Originality/value – Its originality lies in contributing and extending knowledge on CD on FDI in several ways. First, it analyses the data of emerging and industrialized countries, namely, Russia, China, Germany, Italy, Japan, Korea, Spain and the UK. Second, a potential asymmetric impact is explained by the characteristics of the hypothetical value function of the PT. Third, it seeks empirical evidence by applying an econometric model developed to analyse the variables CD and FDI.

Keywords Foreign direct investment, Prospect theory, Corruption distance

Paper type Research paper

1. Introduction

Whenever firms want to expand into international markets, foreign direct investment (FDI) is one possible option to enter the markets (Harrison, 2003). FDI encourages the transfer of technology and know-how by creating direct, stable long lasting links between countries (OECD, 2014). FDI might be important especially for emerging markets. FDI can provide additional financial resources (Wong and Adams, 2002), and, compared to domestic investment, FDI can make a relatively high contribution to economic growth (Borenzstein *et al.*, 1998). FDI can help to boost productivity and growth through the transfer of intangible assets, such as knowledge, technology, skills and management know-how (Wong and Adams 2002). Alam and Ali Shah (2013) argued that market size, labour costs and the quality of infrastructure are the most important factors attracting foreign investment.

From a theoretical viewpoint, the costs of corruption can be regarded as additional costs of doing business or sometimes called "additional tax on profits". In other words, corruption may decrease a company's expected profitability of an investment project in a country. Therefore, firms investing abroad will incorporate the level of corruption of the host country

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into their consideration (Al-Sadig, 2009). Research on the impact of corruption on FDI flows is scant and inconclusive. Al-Sadig (2009), as well as Hakkala *et al.*, (2005), found a positive, whereas Cuervo-Cazurra (2008); Dahlström and Johnson (2007), Drabek and Payne (2002), Habib and Zurawicki (2002), Shleifer and Vishny (1993), Smarzynska and Wei (2000) and Wei (1997, 2000a, 2000b) identified a negative influence of corruption on FDI.

Habib and Zurawicki (2002) introduced the corruption distance (CD) as a measure of the absolute difference in the corruption levels between the source and the host country. Wu (2006) further developed the idea that the CD rather than the level of corruption in the host country affects the behaviour of foreign investors. According to Wu (2006), the negative effect of CD on a corrupt country seeking FDI from a less corrupt country is stronger than the effect would be for a transparent country seeking FDI from a more corrupt country. Thus, one could argue that there is an asymmetric impact of CD on FDI. Also Qian *et al.* (2013) found an asymmetric influence between CD and FDI.

Due to those controversial discussions on the impact of CD and FDI, this paper contributes and extends existing knowledge in several ways. First, it analyses the data of emerging and industrialized countries, namely, Russia, China, Germany, Italy, Japan, Korea, Spain and the UK. Second, it explains a potential asymmetric impact by the characteristics of the hypothetical value function of the prospect theory. Third, it seeks empirical evidence by applying an econometric model developed to analyse the variables CD and FDI.

2. Foreign direct investment

According to Moosa (2002), FDI is a process where investors of a source country acquire ownership of assets aiming to control the production, distribution and other activities in another host country. UNCTAD (2018) described FDI as an investment with a long-term relationship, reflecting a lasting interest and control by a resident entity in one economy in an enterprise resident in an economy other than that of the foreign direct investor. The OECD (2018) understood FDI as a type of long-term investment by a firm in one country in another firm.

The FDI data can be divided into two main groups. The first type is gathered from financial data from the balance of payments. The International Monetary Fund (IMF) publishes the Balance of Payments Statistics Yearbook. These publications include FDI inflows, meaning investments in the reporting economy, as well as FDI outflows, meaning direct investments abroad. Other sources of FDI data are the World Investment Report from UNCTAD and the OECD International Investment Statistics Yearbook.

Inward and outward FDIs represent the second type of FDI data, which are collected during the approval process of government bodies when those are prescribed. This type of FDI data includes information about the number of FDI projects and sector-specific information. Nevertheless, the type of FDI data may not accurately represent actual FDI flows, which could lead to major deviations. Also the measure of FDI faces limitations, as not all countries are using the same threshold of 10 per cent ownership as specified by the OECD. Incremental rather than accumulated ownership percentages are used to report FDI, which can bias the figures. Finally, FDI does not necessarily include a controlling influence or a controlling share in the company (Wong and Adams, 2002).

One major advantage of the FDI data gathered from the OECD is that the database provides FDI flows by partner countries. Therefore, country-level data of outward FDI for OECD countries are used widely to investigate cross-border investments by multinational firms (Wei, 2000a; Habib and Zurawicki, 2002; Wu, 2006). Moreover, for pooled-time series and cross-sectional data analyses, OECD data allow to gain insights on a country-to-country level (Habib and Zurawicki, 2002, Wu, 2006).

3. Corruption distance

Scholars have adopted term "psychic distance" of countries to study the effect of CD on FDI. Qian *et al.* (2013) argued that the selection of a market that is "psychic closer" reduces uncertainty and learning costs about the host country, promoting FDI activities. The greater the psychic distance between source and host country, the more challenging the distance becomes for investors to deal with their counterpart. This increases uncertainty and deters FDI flows. Wu (2006) argued that the corruption level in the host country, as well as the CD, deters cross-border investment.

Karhunen and Ledyaeva (2011) identified a high correlation between CD and FDI. Habib and Zurawicki (2002) found a negative influence of CD on FDI. In other words, CD is not as serious a deterrent of outward FDI from more corrupt countries as it is from less corrupt countries. For less corrupt countries that do not have the same capability to handle corruption compared to firms coming from high corrupt countries, FDI proves to be more challenging for investors from less corrupt countries, which leads to a negative FDI decision for the host country.

According to Demirbag *et al.* (2007), a greater CD increases the likelihood for a joint venture rather than a wholly owned subsidiary in Turkey. The need for local knowledge and hence for local partner increases with CD as firms from less corrupt countries face the inability to handle corrupt administrative customs and local corrupt business, which would lead to a competitive disadvantage. The need for a local partner to assist a foreign direct investor when entering a comparably high corrupt country is greater for firms from non-corrupt countries, whereas others may be better equipped to cope with a corrupt environment (Habib and Zurawicki, 2002).

Research shows that the relationship between CD and FDI is most likely to be asymmetric. Qian *et al.* (2013) examined the effects of positive and negative CD and found out that positive and negative CD has different effects on FDI activities. On the one hand, when a highly corrupt country invests in a less corrupt country, positive corruption distance, CD significantly determines the likelihood and the volume of FDI flows. On the other hand, the negative CD, when a less corrupt source invests in a more corrupt host country, does not have significant effects on FDI. However, the effects vary within different country-pair subsamples. In the industrial–industrial pair sub-samples, both positive CD and negative CD adversely affect the volume of bilateral FDI. However, it seems that a negative CD has a stronger impact than the positive CD on bilateral FDI behaviour.

4. Prospect theory, foreign direct investment and corruption distance

To analyse the asymmetric relationship between CD and FDI, the hypothetical value function of the prospect theory will be used. As shown in Figure 1, the prospect theory postulates that the hypothetical value function is:

- derived from the deviations from the reference point;
- concave for gains and convex for losses; and
- steeper for losses than for gains (Kahneman and Tversky, 1979).

Bearing in mind that people make their decisions based on deviations from a reference point, this finding can be applied to investigate on the behaviour of FDI activities in a comparable low or high corrupt host country. Based on the assumption that the corruption level reflects the uncertainty of an environment and the risk on an investment, investors may base their investment decision by the evaluation of the perceived level of corruption of the host country. The same levels of corruption can be perceived as transparent for one investor and

as corrupt environment for another one, depending on an investor's current reference point, reflected by the level of corruption in the home country. Thus, the perceived level of corruption in the host country is evaluated by the perceived level corruption in the home country. According to the prospect theory, changes in CD below the reference point, negative performance on CD, would be perceived as losses and above, positive performance on CD, as gains. The mean level of CD is therefore applied as reference point in the context of CD and FDI.

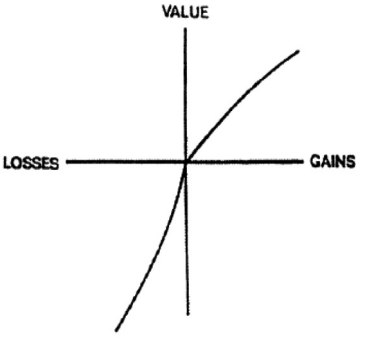
Adopting the notion from loss aversion to the investigation of this paper, negative outcomes of CD should have a greater impact than equal amounts of positive outcomes of CD on foreign direct investment. It should be remembered that the value function of the prospect theory is steeper in the negative than in the positive area, indicating that losses loom larger than gains (Einhorn and Hogarth, 1981). Thus, according to the prospect theory, negative performance on CD should have a greater impact on FDI, showing the characteristic of loss aversion.

Applying the concept of diminishing sensitivity to the variables CD and FDI leads to the following considerations: First, this would mean that an investor who has already invested a relatively large sum in a country is not likely to desist from his investment, although the corruption level is high or even increasing. Second, on the basis of the prospect theory, FDI outflows should display diminishing sensitivity towards CD performance. As the diminishing sensitivity described by the prospect theory occurs in both negative and positive territory of the value function, at high levels of positive as well as high levels of negative performance on CD, FDI outflows should not be affected as dramatically as they do at intermediate levels of CD.

Figure 2 shows the influence of CD on FDI in the context of the value function of the prospect theory. The values on the abscissa reflect the values of the CD, whereas the ordinate is used for the FDI values. Therefore, a negative performance on CD indicates an increase of CD, whereas a positive performance on CD shows a decrease of CD.

Therefore, the following hypotheses are formulated to test these assumptions:

H1. Negative performance on corruption distance will have no greater impact on foreign direct investment outflows than positive performance on corruption distance in the same country. Thus, loss aversion as suggested by PT is not applicable to corruption distance and foreign direct investment.



Source: Kahneman and Tversky (1979)

Figure 1.
Hypothetical value function of the prospect theory

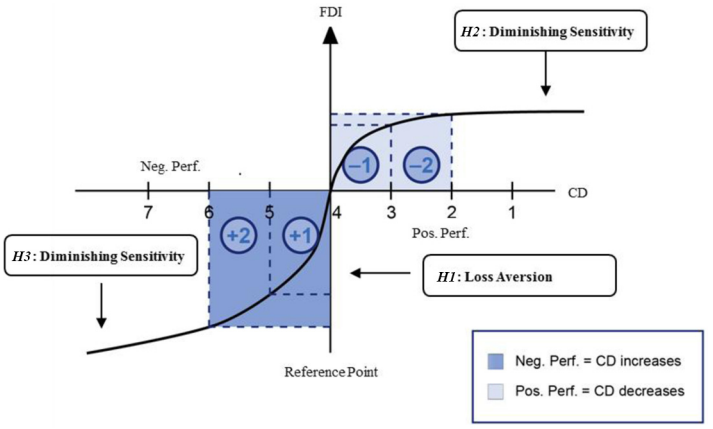


Figure 2.
Negative/positive performance of CD on FDI

To investigate the diminishing sensitivity described by the prospect theory *H2* and *H3* are developed and adopted according to the relationship between CD and FDI. Diminishing sensitivity indicates that at high levels of positive or negative performance on CD, FDI outflows will be affected less than at intermediate levels of CD. To prove this, the following hypotheses test this assumption:

H2. At high level of positive performance on corruption distance, foreign direct investment outflows will not be affected less than at intermediate levels of corruption distance. Thus, diminishing sensitivity according to PT is not applicable to corruption distance and foreign direct investment.

H3. At high level of negative performance on corruption distance, foreign direct investment outflows will not be affected less than at intermediate levels of corruption distance. Thus, diminishing sensitivity according to PT is not applicable to corruption distance and foreign direct investment.

5. Data and methodology

The data set for the present study is derived from Transparency International and OECD. The reason for the dominant use of the Corruption Perception Index (CPI) is due to the fact that data on almost every country are published annually (Judge *et al.*, 2011). The CPI is used, even though the CPI figures are considered as somewhat subjective because an objective approach is almost impossible (Wilhelm, 2002). The CPI ranges from 0 to 10, where a score of 10 reflects a very clean country where almost no corruption is present. In contrast to that, the lowest score 0 denotes a highly corrupt country (Transparency International, 2011).

The FDI outflow data are gathered from the OECD International Direct Investment Database. The OECD relies on the definition of minimum 10 per cent voting power on an enterprise as an evidence for FDI (OECD, 2018). Moreover, the OECD provides FDI flows by partner country to investigate cross-border investment. The OECD database offers data for 35 OECD countries and 307 partner countries, whereas Transparency International publishes the CPI for 135 countries in total. Country-level data from OECD are generally

available from the period 1999 to 2012, but it has to be noted that for several countries and years, data are not available (OECD, 2014).

As common practice in studies on corruption, the corruption variable is recoded in the form of re-scaling as it makes the interpretation more logical (Li and Wu, 2010; Wei, 1997; Smarzynska and Wei, 2000; Hakkala *et al.*, 2005). The corruption level now ranges from 0 to 10, meaning that a low score indicates a low level of corruption and a high score indicates a higher level of corruption.

Following Wu (2006) and Habib and Zurawicki (2002), the same approach to calculate the independent variable CD as the absolute value of the gap in the corruption levels between source country s and host country h, later denoted as $CD_{sh,}$ has been used. The variable CD is used as it represents the fact that a corrupt government is a barrier to a transparent firm and contrary a transparent government hinders a corrupt firm to make use of their ability to handle a corrupt environment (Wu, 2006). In the empirical analysis, the mean level of CD is applied as the reference point in the analysis.

The dependent variable is FDI. Later on, denoted as FDI_{sh}, it is the flow value of outward FDI of country s into country h. FDI data are gathered from the OECD Foreign Direct Investment Database as it provides bilateral FDI data on country level. In the analysis, both the dependent and the independent variable are transformed in logarithm of actual values as it is popular for cross-country analysis (Habib and Zurawicki, 2002; Wu, 2006). Hence, zero observations and observations of negative FDI flows were excluded from the analysis (Wu, 2006). SPSS 21.0 is used for the regression analyses.

5.1 Sample

The effects of a change from the mean level of CDs on FDI between different country-pairs are compared, rather than studying the effect of the level of corruption within a certain country over a specific time. This is an important distinction as it has to be noted that small differences in CPI for individual countries are not statistically significant due to the methodology used by Transparency International (Habib and Zurawicki, 2002).

The corruption data from 2012 onwards are excluded from the analysis of the present paper, as they are based on a different methodology applied by Transparency International. Therefore, two of the main complications can be avoided.

First, the problem of insignificant results of small changes for individual countries is avoided as the different effects of a change from the mean level of CD on FDI between different country-pairs are studied rather than the effects in one country over time. Second, CPI from 2002 to 2011 is used because, for this timeframe, a uniform and consistent methodology to calculate the CPI by Transparency International is given. A timeframe of 10 years has been chosen due to data availability of CPI by Transparency International and FDI data by the OECD website.

Austria is chosen as the source country from where bilateral outward FDI data between eight host countries are analysed. Hence, altogether, eight country-pairs are included in the analysis. The following host country partners for Austria, representing mainly the industrialized economies, but also two emerging markets were selected: Germany, Italy, Japan, Korea, Spain, the UK, China and Russia. The selected host countries cover markedly varying levels of corruption so that data analysis provides a fair representation of lower and higher corrupt host countries.

The study includes an adjusted number of host countries representing FDI data and corruption levels of higher and lower corruption host countries. A few deductions had to be accepted due to the fact that missing values or negative FDI outflows related to a country or year lead to fewer observations (Habib and Zurawicki, 2002; Wu, 2006).

5.2 Econometric model

The idea of the analysis for testing the asymmetry, proposed in the hypotheses, entails separating the estimates for the regression analysis. This means that two separate estimates for a positive and negative "performance" are derived. Therefore, the absolute magnitude of the positive and the negative coefficient can be compared. Comparing the magnitude of both estimates allows testing the negative asymmetric (non-linear) relationship postulates by the prospect theory (Mittal *et al.*, 1998). Therefore, for testing the expected negative asymmetric, (non-linear) relationship suggested by the PT, the negative coefficient has to be greater than the positive coefficient. In other words, the following assumption has to be met:

$$[negative\ coefficient] > [positive\ coefficient] \quad (1)$$

By following Mittal *et al.* (1998) and Chen (2002), as well as Burböck (2014), the function of the regression analysis with the independent variable (CD) and the dependent variable (FDI) will have the following form:

$$LNFDI^{t}{}_{sh} = Intercept + \left(LN\_CD^{t}{}_{sh} * x\right) + \left(LP\_CD^{t}{}_{sh} * x\right) \quad (2)$$

To investigate empirically the impact of CD on FDI, the paper takes the absolute value of the gap in the corruption levels between source country s and host country h, denoted as CD_{sh} (Wu, 2006). The dependent variable $FDI^{t}{}_{sh}$ is the flow value of outward FDI of source country s into host country h during the year t. The independent variable denoted $CD^{t}{}_{sh}$ is the CD between country s and country h during the year t (Wu, 2006).

In the equitation, both the dependent and independent variable are in logarithm of actual values. The dependent variable LN of FDI is the annual outflow between the home country and the host country. As the LOG of FDI is used, the distribution is nearly normal and the error term homoscedastic (Habib and Zurawicki, 2002).

As logarithm of 0 or negative numbers cannot be calculated, negative FDI outflows and zero observations are excluded from the analysis (Wu, 2006). This approach is in line with that of Habib and Zurawicki (2002) and Qian *et al.* (2013), who also used logarithmic values of FDI data for their analysis.

Adapting the model by Mittal *et al.* (1998); Ting and Chen (2002) and Burböck (2014) in the present formula, the construct CD is split into two variables LN_CD and LP_CD. Respectively, L indicates the natural logarithm of the variable, corruption distance, denoted LN_CD or LP_CD. Furthermore, the N indicates the negative and the P the positive deviation or performance from the mean level of CD.

The split of the variable CD into negative (LN_CD) and positive (LP_CD) is conducted with reference to the following prerequisites: If the deviation from the first value is negative, the measurement variable for negative performance, LN_CD, equals ln (-CD) and LP_CD equals to zero (Mittal *et al.*, 1998; Ting and Chen, 2002). To illustrate the transformation process, the following example is demonstrated: If the first value has a negative deviation of −4, LN_CD = ln [−(−4)], and consequently LP_CD= 0. Inversely, if a score is 3, LP_CD = ln (3) and LN_CD = 0 (Mittal *et al.*, 1998; Ting and Chen, 2002; Burböck 2014).

As calculating the negative logarithm of negative numbers is not possible, the minus for CO for negative deviations allows to make the final outcome positive. This means, setting a minus before a negative score yields to a positive score as minus times minus equals plus. Again, for instance, a negative score of −4 yields +4 by setting the variable to –(−4), enabling to take the natural logarithm. In contrast to that, if the deviation from the mean

level of CD is greater and/or not equal to zero, in other words positive, this is indicated by LP_CD (Mittal *et al.*, 1998; Ting and Chen, 2002; Burböck, 2014).

Natural logarithms to CD are used to determine whether the relationship between CD and FDI is nonlinear and to find out whether the impact of CD is diminishing at certain levels (Ting and Chen, 2002). Therefore, the regression analysis in this paper applies LN FDI as the dependent variable and LN_CD, as well as LP_CD as the independent variable. Furthermore, to study the effects of CD on FDI, a regression analysis is performed for each country-pair. This method results in two coefficients for each country-pair ($\beta 1$ and $\beta 2$), which makes it possible to test the characteristics of the prospect theory, as two coefficients are estimated for each country-pair for a total of 16 (2×8) coefficients.

This measurement method allows testing the pre-established hypotheses regarding loss aversion and diminishing sensitivity. Thus, this procedure supports the achievement of two relevant objectives of this paper.

First, this method allows the comparison of the coefficients in order to test the hypothesized asymmetry. In this respect, an asymmetric relationship between CD and FDI is supported when the coefficients of positive (LP_CD) and negative performance (LN_CD) are not equal. In addition, a negative (non-linear) relationship between CD and FDI is supported if LN_CD has a greater beta coefficient than LP_CD. (Ting and Chen, 2002) In other words, for example if a country-pair shows a larger coefficient in absolute values for negative performance than its coefficient for the positive performance, the negative asymmetry, postulated by the prospect theory can be supported. Thus, loss aversion as suggested by the prospect theory is applicable to CD and FDI.

Second, the natural logarithmic transformation of both CD variables (LN_CD and LP_CD) allows testing the diminishing sensitivity. Therefore, to prove the diminishing sensitivity in negative, as well as positive territory, both coefficients ($\beta 1$ and $\beta 2$) have to be statistically significant. If this is the case, the diminishing sensitivity and non-linear characteristics postulated by the prospect theory could be supported (Mittal *et al.*, 1998; Ting and Chen, 2002).

The greater the absolute value of the coefficient, the greater the impact of CD on FDI. In other words, the magnitude of CD on FDI can be analysed by the estimates of the absolute values of the coefficient, indicating that the greater the absolute value of the coefficient, the greater the impact of CD on FDI (Ting and Chen, 2002).

The positive or negative effect of CD on FDI can be seen by the algebraic sign of the coefficient, meaning that a positive (+) or negative (−) impact is indicated by the algebraic sign. For instance, if a county-pair shows a negative (−) coefficient for CD, it is interpreted that CD has a negative impact on FDI. Normally, the coefficient for LN_CD should show a negative sign, whereas the coefficient for LP_CD should be positive (Ting and Chen, 2002).

6. Empirical results

Table I shows the coefficients for LN_CD and LP_CD as well as their significance level. The R^2 values explain the gauge of the substantive size of the relationship between the variables. In other words, R^2 illustrates how much of the variability in FDI outflows is shared by CD (Field, 2009). As the main objective is to test the asymmetry postulated in the hypotheses rather than explain the variation in FDI, a low value of R^2 is not that problematic (Mittal *et al.*, 1998). Furthermore, the standard error of the estimate is a measure of the accuracy of predicted values in a regression (Malhotra, 2012).

The results in Table I indicate a negative asymmetric relationship. In other words, a loss aversion exists between CD and FDI in five out of eight countries. The results show that for Germany, Korea, Spain, China and Russia, the absolute values of LN_CD exceed the values

of LP_CD, indicating that there might be a negative asymmetric relationship between CD and FDI in these countries. However, as results are predominantly not significant, $H1_0$ cannot be falsified. In other words, negative performance on CD will have no greater impact on FDI outflows than positive performance on CD in the same country. Thus, it means that the feature of loss aversion suggested by the prospect theory cannot be supported with the empirical results.

To prove the diminishing sensitivity, both coefficients (LN_CD and LP_CD) have to be statistically significant. Thus, diminishing sensitivity postulated by PT would be supported. In fact, the results show that, for Germany, Japan, Korea, Spain, China and Russia, the coefficients (LN_CD and LP_CD) exceed the critical significance value of 0.05 and therefore these results are not significant. As results are predominantly not significant, except for Italy and the UK, it means, that at a high level of positive/negative performance on CD, FDI outflows will not be affected less than at intermediate levels of CD. Therefore, *H2* and *H3* could not be falsified. In other words, the characteristic of diminishing sensitivity in the sense of the prospect theory cannot be proven by the empirical results.

7. Discussion

The results show that there might be a negative asymmetric relationship between CD and FDI in five out of eight countries. Thus, the characteristic of loss aversion would be applicable to these countries. However, results are predominantly not significant and therefore the discussion has to be judged with care. Also Qian *et al.* (2013) could not find significant proof on FDI when a relatively low corrupt source country invests in a higher corrupt host. Furthermore, and in line with the present empirical tendency of the results, the results show that there is an asymmetric effect of CD when an industrial country invests in a developing country. However, these effects change across different country-pairs, for instance, if an industrial source country invests in an industrial host country, negative as well as positive CD reduce bilateral FDI. Interestingly, and in line with the prospect theory for the industrial–industrial country-pair, it shows that the negative CD has a stronger impact than the positive one, indicating that the reduction effect of the negative CD is stronger than the positive one. However, for other sub-samples, Qian *et al.* (2013) suggested that the positive CD (positive performance on CD) is the more prominent driver in the effects of the absolute CD on bilateral FDI. More precise, in the case a relatively high corrupt source country invests in a less corrupt host country (positive CD/or positive performance on CD), the CD significantly reduces the FDI flows. Interestingly, also Wu (2006) argued that the negative impact of CD on a corrupt country seeking FDI from a less corrupt country is stronger than on a transparent country seeking FDI from a more corrupt country.

Country	LN_CD ($\beta 1$)	Significance	LP_CD ($\beta 2$)	Significance	R^2	Std. error of the estimate
Germany	−0.741	0.176	−0.236	0.434	0.310	0.96417
Italy	−1.044	0.057	−1.598	0.014	0.669	0.78161
Japan	−0.157	0.734	0.453	0.365	0.237	1.17474
Korea	−3.669	0.319	−1.608	0.667	0.397	0.92311
Spain	−0.430	0.544	−0.370	0.635	0.101	1.14580
UK	0.759	0.047	2.190	0.127	0.579	0.86909
China	0.339	0.555	−0.327	0.837	0.145	1.25676
Russia	−0.375	0.296	−0.144	0.788	0.198	1.21749

Table I. Summary of results of the regression analysis

As the absolute values of LN_CD are higher than LP_CD, it can be stated that in Germany, Korea, Spain, China and Russia, the negative deviation has a greater impact on FDI than the positive deviation has in Italy, Japan and the UK. If results were significant, they would indicate that LN_CD is the decisive determinant in Germany, Korea, Spain, China and Russia. Furthermore, LN_CD carry a negative algebraic sign in these countries (except for China). Thus, it is interpreted that, for Germany, Korea, Spain, China and Russia, a negative asymmetric relationship exists. Furthermore, the negative algebraic sign of LN_CD indicates that the impact of CD on FDI is negative. In other words, negative performance on CD has a negative effect on FDI. Thus, it is argued that an increase of CD leads to a decrease of FDI. This finding would support the "grabbing hand theory" or that corruption is "sand" in the wheel of commerce for new firms, meaning that corruption raises uncertainty and the costs of operating in a corrupt environment (Cuervo-Cazurra, 2008). On the contrary, for Italy, Japan and the UK, which show a positive asymmetric relationship, displayed in Table I, LP_CD predominantly shows a positive algebraic sign (except for Italy). Hence, one could say that in Japan and UK, positive performance on CD has a positive impact on FDI. In other words, a decrease of CD leads to an increase of FDI. This result is contradictory to the "helping hand theory" or the role of corruption as a "grease" wheeler that suggests that an increase of corruption leads to an increase of FDI (Campos *et al.*, 2010; Cuervo-Cazurra, 2008).

The present empirical results, if significant, suggest that the negative performance of CD is the more prominent driver in the effects of CD on FDI. This is in line with Barassi and Zhou (2012) who hints that the overall effect of corruption on the likelihood of FDI taking place is significantly negative. However, after correcting for MNEs' location choice, the impact of corruption on the levels of FDI stock is significantly positive. Furthermore, it indicates that once MNEs have decided to invest in a certain country, they do not show risk-averse behaviour, meaning that an increase in the level of corruption in a host country could even lead to an increase in FDI stocks. Hence, this finding provides support for the theory of the "helping hand" role of corruption (Barassi and Zhou, 2012). Comparing this statement with findings from the present empirical work, it has to be noted that the present analysis does not capture a brake-down of the FDI data by firm level. However, the empirical results concerning the positive asymmetric relationship found in Italy, Japan and the UK are somewhat contradictory to the findings from Barassi and Zhou (2012). One explanation of Barassi and Zhou (2012) might be that MNEs have been putting less attention to corruption since 1999 when it comes down to FDI decisions (Barassi and Zhou, 2012; Egger and Winner, 2006). Furthermore, the OECD Anti-Bribery Convention had very limited impacts on the behaviour of companies, meaning that firms have not become more averse to the level of corruption in the host country, after its implementation (Barassi and Zhou, 2012). Besides, another reason could be that, in emerging markets such as China and Russia, market growth and chances in factor endowments may be more important determinants of FDI rather than corruption (Egger and Winner, 2006). However, as the present paper finds that the negative performance of CD has a relatively greater impact on FDI than the positive one, this finding is contradictory to the results of Barassi and Zhou (2012).

8. Conclusion

Summing up, some authors argue that there is either a positive or a negative asymmetric effect of corruption on FDI. The prospect theory is used as a theoretical

model in this study to justify a potential asymmetric relationship between these variables. The aim of the empirical analysis was to investigate on the impact of CD on FDI and find potential explanations with the help of the characteristics of the hypothetical value function of the prospect theory. As the empirical results were predominantly insignificant, the characteristic features of loss aversion and diminishing sensitivity could not be proven.

The relationship between corruption and FDI remains a very controversial topic and extensive further research is required to better understand the full context of corruption and FDI. Through the complexity and the interrelated factors concerning corruption and FDI, not to mention potential other variables, no general statement about the impact of CD and FDI can be made. However, the results of this study, displayed in Table I, show a tendency that the negative performance on CD, with the exception of Italy, Japan and the UK, has a stronger impact on FDI than the positive one. This potential negative asymmetric impact should not be neglected in practice. For policymakers, it makes sense to focus on a reduction of corruption in countries where a negative asymmetric relationship is found, as an increase in CD might have a stronger impact on investment flows than a potential decrease of CD.

9. Limitations and research outlook

This paper tries to be as comprehensible as possible; a few deductions, however, have to be accepted and thus the following constraints limit the generalizability of this paper.

As seen in the literature, the effects of corruption may depend, for instance, on the type of FDI (Brouthers *et al.*, 2008), type of corruption (Cuervo-Cazurra, 2008) or the role of institution (Al-Sadig, 2009). However, in the present study, accumulated FDI figures are used for the statistical analysis and no separate analysis of the different types of FDI or types of corruption has been designed mainly due to data constraints. Furthermore, the potential important role of institutions has not been incorporated in this analysis.

Besides, the results of the analysis depend on the variable used to measure corruption. In this respect, the CPI from Transparency International used in this paper is not the only indicator measuring corruption. In fact, CPI is the most empirical researched and used indicator. However, different variables measuring corruption could lead to different results. Judge *et al.* (2011) summarized that there are generally two other indicators available, namely, the World Bank's Control of Corruption Index and the Corruption Index by the Political Risk Services Group. These indicators measure other components of corruption. Therefore, using these variables in the present analysis may lead to different results.

Furthermore, major limitations of this paper may be found in the small sample size used. The reason for the small sample size is due to the fact that zero observations and negative FDI values were dropped from the analysis as logarithm of zero or negative numbers cannot be calculated. The approach for the selection of the sample is somewhat in line with that of Wu (2006), who also excluded zero and negative FDI values in his analysis. Furthermore, according to the OECD (2014), negative FDI values could indicate disinvestment in assets or discharges of liabilities. However, a larger sample size due to an added constant as suggested by Field (2013) could lead to better or different set of results. Furthermore, the small timeframe of 10 years may also affect the results of the regression analysis. A longer time period may deliver different or better results. In addition, in the empirical analysis, the significance level of 0.5 per cent

was not met. Therefore, results have to be interpreted with caution and findings cannot be generalized.

Future studies could investigate the impact of CD on FDI with the characteristics of the prospect theory though with using different variables. It may be an interesting approach to incorporate the "level of knowledge about corruption" into studies, for example. Furthermore, it would be desirable to include more countries, a larger sample and longer timeframe in future analyses. As there are different types of corruption and various types of FDI, it would be interesting to see the impacts of corruption on FDI incorporating these types in the analysis. Further studies could investigate the link between CD and cultural distance *per se*. Another interesting approach would be to further investigate the impact of CD on a company's entry mode in corrupt countries.

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