THE IMPORTANCE AND DYNAMICS OF TYPES OF DISTANCE: AN EMPIRICAL TEST OF GHEMAWAT'S *CAGE* FRAMEWORK

ABSTRACT

Ghemawat's (2001) CAGE distance framework proposes that firms operating across borders have to deal with four important types of distances between countries, i.e. cultural, administrative, geographic, and economic. While prior studies have examined the impact of several of these distances on a multitude of international business phenomena, the absolute and relative importance of all four distance types for firm internationalization is so far unclear. In this paper we fill this gap in the literature by examining the absolute and relative effects of the CAGE distance dimensions on the magnitude of countries' bilateral foreign direct investment (FDI) stocks. Analyzing the FDI stocks of six major economies in 71 developed and developing countries over the 1996-2002 period, we find that all four distance types have a significantly negative impact on these FDI stocks, with geographic distance having the largest negative effect, followed by cultural, economic, and administrative distance. We also find that, instead of decreasing over time, the negative impact of the four CAGE distance dimensions seems to have grown in recent years, with especially administrative and geographic distance becoming increasingly important barriers to FDI.

INTRODUCTION

The rapid advances in information and communication technologies of the last few decades have been argued to decrease the importance of distance for firms (O'Brien, 1992). Some have even announced the 'death of distance' (Cairncross, 1997). In contrast, others have argued that distance is and will remain an important factor for firms, even in a technologically-connected and globalized world (Ghemawat, 2001; Alstyne and Brynjolfsson, 2005; Van Tulder and Van der Zwart, 2006). According to Nachum and Zaheer, "[d]istance is fundamental in international business theory, and implicitly or explicitly occupies a central position in all its subfields" (2005: 747). However, 'distance' is a broad concept that consists of several dimensions. Ghemawat's (2001) CAGE distance framework distinguishes four basic dimensions of distance, viz. cultural, administrative, geographic, and economic, and suggests that firms operating across borders have to deal with each of these distance dimensions. While previous international business (IB) research has typically examined the impact of one or two of these dimensions on such cross-border phenomena as firm-level entry mode decisions and macro-level foreign direct investment (FDI) flows, the absolute and relative importance of *all four* distance dimensions for firm internationalization is so far unclear. In this paper we fill this gap in the literature by empirically exploring the absolute and relative effects of the four CAGE distance dimensions on one important IB phenomenon, i.e. the magnitude of countries' bilateral FDI stocks. Specifically, we aim to answer the following four questions: (1) Which CAGE distance dimensions affect bilateral FDI stocks? (2) How large is the relative effect of each dimension? In other words, are some dimensions a larger barrier to FDI than others? (3) What are the relative effects on bilateral FDI stocks of the different components of the cultural and administrative distance dimensions, such as inter-country differences in power distance and political stability? (4) Have the effects of the

CAGE distance dimensions on bilateral FDI stocks changed over time, and has this change been larger for some dimensions than for others? Analyzing the FDI stocks of six major economies (the US, the UK, Japan, Germany, France, and the Netherlands) in 71 developed and developing countries over the 1996-2002 period, we find that all four distance types have a significantly negative impact on these FDI stocks, with geographic distance having the largest negative effect, followed by cultural, economic, and administrative distance. We also find that, instead of decreasing over time, the negative impact of the four CAGE distance dimensions seems to have grown in recent years, with especially administrative and geographic distance becoming increasingly important barriers to FDI.

To the best of our knowledge, our paper is the first empirical IB study that considers both the absolute and relative impact of all four dimensions of distance. We thus respond to Nachum and Zaheer (2005)'s call that there is "a need for more research on the various dimensions of distance" (2005: 764). The remainder of this paper is structured as follows. In the next section we briefly review prior research that has examined the impact of the various CAGE distance dimensions on firm internationalization. We then describe our research methodology, in particular our sample, data sources, variables, and statistical method. In a subsequent section we present our empirical results, while the final section concludes.

LITERATURE REVIEW

Ghemawat's (2001) CAGE distance framework proposes that multinational enterprises (MNEs) face four types of distance between their parent country and the host countries of their foreign activities, viz. Cultural, Administrative, Geographic, and Economic (CAGE). The larger each of these distances to a specific host country, the more difficult it becomes for MNEs to do business

in that country. Cultural distance can be defined as the extent to which the shared norms and values in a specific host country differ from those in the MNE's parent country (Hofstede, 1980; Kogut and Singh, 1988). Culturally-distant countries have divergent organizational and management practices (Kogut and Singh, 1988), consumer preferences (Ghemawat, 2001), and communication styles (Adler, 1986), making it difficult for MNEs to successfully do business in such countries. The cultural distance to a country has been shown to have a negative impact on the amount of FDI in that country (Loree and Guisinger, 1995; Sethi et al., 2003), as well as on the performance of foreign subsidiaries in general (Li and Guisinger, 1991; Barkema et al., 1996) and international joint ventures (Barkema and Vermeulen, 1997; Mjoen and Tallman, 1997) and cross-border acquisitions (Datta and Puia, 1995) in particular. Furthermore, entry mode research has shown that a large cultural distance leads MNEs to prefer joint ventures over wholly-owned subsidiaries (Agarwal, 1994; Barkema and Vermeulen, 1997; Brouthers and Brouthers, 2001), and greenfield over acquisition entry (Cho and Padmanabhan, 1995; Larimo, 2003).

Administrative or regulatory distance can be defined as the extent to which the administrative system in one country – consisting of rules, laws, regulations, and government policies – differs from that in another (Ghemawat, 2001; Xu and Shenkar, 2002). Firms entering countries with a radically-different administrative system experience high levels of uncertainty and will hence find it difficult to successfully do business there. Consequently, Xu and Shenkar (2002) proposed that MNEs are more likely to enter such countries through minority-owned joint ventures rather than through wholly- or majority-owned ventures. Xu et al. (2004) recently found that a large regulatory distance indeed leads MNEs to choose lower ownership stakes in their foreign subsidiaries. Habib and Zurawicki (2002) found that greater absolute differences in corruption levels between countries result in smaller FDI flows between them. Instead of focusing on the administrative distance between parent and host countries, some studies focused

on (aspects of) the administrative quality of the host country. Delios and Henisz (2000) found that MNEs take lower levels of equity ownership in subsidiaries located in politically-unstable countries, while Globerman and Shapiro (2003) found that countries with a high-quality administrative system receive more US FDI. Habib and Zurawicki (2002) found that corrupt countries receive significantly less FDI than non-corrupt ones.

Geographic distance refers to the physical remoteness of countries. This distance dimension has predominantly been used to explain the amount of merchandise trade between countries, as well as the magnitude of countries' FDI inflows and inward FDI stocks. There is abundant empirical evidence that the amount of merchandise trade between countries decreases with the geographic distance between them (for an overview, see Frankel, 1997), presumably because the costs of transporting merchandise increase with geographic distance. Geographically-distant countries have also been found to have lower FDI inflows (Cuervo-Cazurra, 2006; Wei, 2000; Bevan et al., 2004) and lower inward FDI stocks (Blonigen et al., 2003; Braconier et al., 2005), presumably because senior MNE managers generally find it more difficult and costly to monitor subsidiaries located in geographically-distant countries, thus lowering their incentive to establish subsidiaries in such countries (Carr et al., 2001; Shenkar, 2001).

Economic distance, finally, refers to the extent to which countries differ from one another in terms of their level of economic development. This type of distance is therefore sometimes also referred to as development distance (Van Tulder with Van der Zwart, 2006). According to Ghemawat, "[t]he wealth or income of consumers is the most important economic attribute that creates distance between countries, and it has a marked effect on the levels of trade and the type of partners a country trades with" (2001: 145). He argues that both developed and less-developed countries tend to trade more with developed countries than with less-developed countries. This is in contrast to Linder (1961), who argued that countries with similar levels of economic

development have similar demand structures, and hence trade more with one another than those with different levels of economic development. Specifically, while Ghemawat (2001) proposes that less-developed countries trade more with developed ones, Linder (1961) suggests that less-developed countries trade more with other less-developed countries. To the best of our knowledge, very few, if any, IB studies have so far included the economic distance between parent and host countries as an explanatory variable in their models, with most studies limiting themselves to studying the effect of the level of economic development of the parent or host country.

The above review makes clear that various IB studies have taken into account the potential impact of different dimensions of distance, albeit some dimensions have received more attention than others. However, none of the studies reviewed have simultaneously examined the impact of all four CAGE distance dimensions, with most studies considering only one or two dimensions, nor have they assessed the relative importance of these dimensions. Moreover, it is so far unclear whether the impact of the CAGE distance dimensions has changed over time, and if so, how. Below we fill this gap in the literature by empirically exploring the absolute and relative effects of the four CAGE distance dimensions on the magnitude of countries' bilateral FDI stocks, as well as changes in these effects over time.

METHODOLOGY

Data and sample

We collected our data from several secondary sources (to be specified below) on as many country pairs (dyads) as possible. This resulted in panel data on the dyadic relationships between the six major foreign investor countries worldwide (i.e., the US, Japan, Germany, the UK, France and

the Netherlands) with 71 host countries for the 1996-2002 period. We focus on this time period because of missing data on administrative distance prior to 1996 and on FDI stocks after 2002. Table 1 lists the host countries (and regions) included in the sample, and shows that they are diverse in terms of both geographic location and level of development. This suggests that our sample represents the total number of countries worldwide well, and contains much variation in the different distance dimensions. We have FDI stock data for 2940 country pairs (i.e., {6 parent countries * 71 host countries * 7 years} -/- 6*7 self ties).

[Table 1 approximately here]

Variables

FDI stock (logFDI). Following Blonigen et al. (2003) and Braconier et al. (2005), our dependent variable is the log of the FDI stock of country *i* in country *j* in year *t*. We use FDI stock rather than FDI flow data because FDI stocks are far less volatile than FDI flows and hence better to relate to our distance measures, since these are relatively time-invariant as well. Some have argued that foreign affiliate sales are a better indicator of the magnitude of foreign MNE activity in a country than FDI stocks in that country (Carr et al., 2001). However, while FDI stocks indeed do not reflect all MNE activity in a country since MNEs may also finance foreign affiliates with funds obtained outside their parent country (Hennart, 2000), foreign affiliate sales data also have problems in that MNEs may realize high foreign affiliate sales without extensive local production. Hence, we consider FDI stocks at least as good an indicator of the magnitude of foreign MNE activity in a country as foreign affiliate sales. In fact, studies that have used both FDI stocks and foreign affiliate sales as their dependent variables have obtained similar results for these two variables, and found that they correlate well (e.g., Blonigen et al., 2003).

For the six largest foreign investor countries worldwide, i.e. the US, Japan, Germany, the UK, France and the Netherlands, we collected data on their outward FDI stocks in specific host countries. These six countries account for 63 percent of the global outward FDI stock (UNCTAD, 2006). Their outward FDI stocks broken down by host country were obtained from their National Statistics Offices or Central Banks. Since data on the actual Japanese FDI stocks in specific countries were only available for a limited number of host countries, we estimated the magnitude of these stocks for Japan. Specifically, we used Japanese FDI outflow data broken down by host country to calculate the percentage of accumulated FDI outflows to each host country. We then used this percentage to assign the aggregate Japanese outward FDI stock to each of these countries. The Pearson correlation between these FDI stock estimates and the actual FDI stock data that were available on a country-by-country basis (for 25 countries) was 0.89 ($p<0.001$), indicating that these estimates are good approximations of the actual FDI stocks in each host country.

Given the time lag in the publication of detailed FDI stock data, the latest year for which such data was available for each investor country is 2002. Since not all investor countries include the same host countries in their outward investment statistics, we only included those host countries for which data was available for at least three of the six investors for the entire 1996-2002 period, resulting in a total of 71 host countries.

Since data collection methods may vary across countries, a potential disadvantage of our dataset is that it consists of FDI data drawn from different national sources. However, with the exception of Japan, each national source used employs exactly the same methodology, namely that used by the OECD Direct Investment Yearbook, the only known official source of bilateral FDI data. However, an advantage of going back to the original national data sources rather than using the OECD data on FDI stocks is that we are able to include a wider variety of developing

countries (49 vs. 25) and, in some instances, have less missing values than the OECD dataset, as national data are more regularly updated.

Cultural distance (culdist). We measure the cultural distance between country pairs through the widely-used Kogut and Singh (1988) index, which is based on the differences in scores on each of Hofstede's (1980) four dimensions of national culture, i.e. power distance, uncertainty avoidance, individualism, and masculinity. While acknowledging its limitations (e.g., Shenkar, 2001), we consider this index to be the best measure of cultural distance available, since many studies have confirmed the validity of Hofstede's dimensions (Van Oudenhoven, 2001; for an overview of earlier replications, see Sϕndergaard, 1994) and since the scores on these dimensions are available for a large number of countries. Alternative national culture frameworks such as those of Trompenaars (1993), Schwartz (1994), and House et al. (2004) have strengthened Hofstede's findings rather than contradicted them (Smith and Bond, 1999; Kirkman et al., 2006; Hofstede, 2006).

Administrative distance (admdist). Our measure of administrative distance is based on Kaufmann et al.'s (2004) analysis of several hundreds of variables measuring administrative quality drawn from 25 sources, including the Economist Intelligence Unit's *Country Risk Service*, the *International Country Risk Guide*, the World Bank's *Country Policy and Institutional Assessments*, and the World Economic Forum's *Global Competitiveness Report*. Using an unobserved components model, Kaufmann et al. identified six dimensions of administrative quality along which countries differ, i.e.:

1. Voice and Accountability, which reflects the extent to which a country's citizens are able to participate in the selection of governments, as well as the extent to which these governments are monitored and can be held accountable for their actions.

2. Political Stability, which measures the likelihood that a country's government will be overthrown through unconstitutional interference, such as domestic violence or terrorism.
3. Government Effectiveness, which reflects the extent to which the government is able to formulate and implement good policies and deliver public goods. It focuses on the quality of public service provision, the quality of the bureaucracy, the competence of civil servants, and the credibility of the government's commitment to policies.
4. Regulatory Quality, which measures the quality of the actual policies, such as the degree of regulation of foreign trade and the incidence of market-unfriendly policies.
5. Rule of Law, which measures the degree to which a country's citizens have confidence in the law and comply with the rules of society. It concentrates on the quality of the legal system and the enforceability of contracts.
6. Control of Corruption, which reflects the degree to which public power is exercised for private gain.

Kaufmann et al. (2004) assigned most of the 199 countries included in their analysis a score on each dimension for the years 1996, 1998, 2000, and 2002 that varied between -2.5 and 2.5, with higher values indicating higher administrative quality levels. We measure the administrative distance between our parent and host countries through a Kogut and Singh (1988)-like index based on the differences in the scores on each of the six administrative quality dimensions. For the years 1997, 1999, and 2001, we used the dimension scores of the preceding year.

Geographic distance (geodist). Following previous studies, we measure the geographic distance between parent and host countries through the great-circle distance in kilometers between their capitals. This distance was obtained from CEPII, the leading French research center in international political economy.

Economic distance (ecodist). In line with Linder (1961) and Ghemawat (2001), we measure the economic distance between countries through the PPP-corrected difference in their GDPs per capita (in constant 2000 US dollars). This data was obtained from the *World Development Indicators*.

Control variables. To control for other factors influencing the magnitude of countries' FDI stocks, we include the remaining variables from the knowledge-capital model (Carr et al., 2001; 2003; Bloningen et al., 2003; Braconier et al., 2005). This model aims to simultaneously explain horizontal or market-seeking FDI (motivated by market access) and vertical or efficiency-seeking FDI (motivated by labor endowment differences), and includes measures of the countries' size, skill endowments and trade and investment costs, and the interactions among them. The first two variables include the sum of GDPs of country *i* and country *j* (gdps) and the squared difference in their GDPs (gdpd2). Both variables intend to capture horizontal FDI, the expectation being that markets that are larger and more similar in size allow firms to share the higher fixed costs of operating across borders (Egger and Pfaffermayr, 2004). The GDP data are measured in millions of constant 2000 US dollars.

The model also includes a measure of the difference in skilled labor abundance between the parent and host country (skd), since such differences stimulate vertical FDI from skilled labor abundant to unskilled labor abundant countries. A country's skill endowment is measured by its gross secondary school enrollment ratio. Since the effect of differences in skilled labor abundance on vertical FDI should be weaker when the difference in economic size of the parent and host country is larger, the knowledge-capital model also includes an interaction term of the difference in skilled labor abundance between the parent and host country and the difference in GDP between them (skdgdpd). Since countries receive less FDI when investment and trade costs are high, the model also includes two variables that measure the magnitude of costs for each host

country (logfopen_h and topen_h). Investment and trade costs are proxied by the inverse of the host country's FDI stock as a percentage of its GDP, and its exports and imports as a percentage of its GDP, respectively. Finally, the knowledge-capital model includes an interaction term of the squared skill difference between the parent and host country and the magnitude of the trade costs in the host country (skd2topen_h), since trade costs discourage vertical FDI but stimulate horizontal FDI ('tariff jumping'). All data used to construct the above control variables comes from the *World Development Indicators*, except for the aggregate inward FDI stock data, which were taken from UNCTAD's *World Investment Report*.

Estimation

When analyzing a panel dataset like ours, it is critical to select the appropriate regression technique, since the failure to correct for problems common to panel data, such as heteroskedasticity, autocorrelation, and potential endogeneity, may result in inefficient and even biased regression coefficients. To counter these problems we first of all use a fixed-effects model specification by including parent country, host country and annual dummy variables. Second, we employ and report heteroskedasticity-corrected rather than regular standard errors, as a Breuch-Pagan test showed that heteroskedasticity was a substantial problem in our dataset ($Chi^2(9) = 137.18$; $p<0.001$). Third, we tested for the presence of first-order autocorrelation in the data using Wooldridge's (2002) test for panel data, and found strongly significant autocorrelation ($F(1.348) = 34.937$, $p=0.000$). Hence we use a generalized least-squares (GLS) AR(1) specification for all our models. For most models, the coefficient of autocorrelation ρ is approximately 0.85. This means that the estimated coefficients should almost be interpreted as referring to a first difference model in which a *change* in the independent variable results in a *change* in the dependent variable. A final potential problem is multicollinearity among our independent variables, which

may make it difficult to distinguish the individual effects of these variables. We therefore examined the variance inflation factors (VIFs) of all variables and found that these factors had a mean value of 4.54, with those of the distance variables having below-average values, and only those of gdps and gdpd2 being higher than the critical value of 10. We also examined the condition indices and found that the overall condition number was 8.8. All these statistics indicate that multicollinearity is not a serious problem in our models and, even if it is present, only for the control variables, and not for our distance variables.

To answer our first three research questions, we estimated the following model:

$$LogFDI_{ijt} = \alpha_i + \alpha_j + \alpha_t + \beta_1 gdps_{ijt} + \beta_2 gdpd2_{ijt} + \beta_3 skd_{ijt} + \beta_4 fopen\_h_{jt} + \beta_5 topen\_h_{jt} + \beta_6 skd2topen\_h_{ijt} + \beta_7 culdist_{ij} + \beta_8 admdist_{ijt} + \beta_9 geodist_{ij} + \beta_{10} ecodist_{ij} + \varepsilon_{ijt} \quad [1]$$

where *i* and *j* refer to the parent and host country of FDI, and *t* to the year of observation.

To answer our fourth and final research question, i.e. whether the effects of the CAGE distance dimensions have changed over time, we interacted each distance variable (dist) with a time-trend variable taking the values of 1 (for 1996) to 7 (for 2002). This results in the following model:

$$LogFDI_{ijt} = \alpha_i + \alpha_j + \alpha_t + \beta_1 gdps_{ijt} + \beta_2 gdpd2_{ijt} + \beta_3 skd_{ijt} + \beta_4 fopen\_h_{jt} + \beta_5 topen\_h_{jt} + \beta_6 skd2topen\_h_{ijt} + \beta_7 culdist_{ij} + \beta_8 admdist_{ijt} + \beta_9 geodist_{ij} + \beta_{10} ecodist_{ij} + \beta_{11} time_t + \beta_{12} dist \times time_{ijt} + \varepsilon_{ijt} \quad [2]$$

Next to estimating the above model specifications, we also performed several robustness checks by measuring cultural and administrative distance through a Euclidean distance index (see e.g., Barkema and Vermeulen, 1997; Brouthers and Brouthers, 2001) rather than through the Kogut and Singh (1988) index, and, given the bi-annual nature of the Kaufmann et al. (2004)

administrative quality data, by excluding the uneven years 1997, 1999, and 2001 from our analyses.

RESULTS

Table 2 and 3 present the descriptive statistics of our variables and the correlations among them. Table 3 shows that many of the variables are significantly correlated, with in some cases high coefficients. Many independent variables are significantly correlated with FDI stocks. As expected, our four distance variables are all negatively correlated with these stocks. Administrative distance is highly correlated with several other variables, notably those containing the skill differences term (i.e., skd and skd2topen_h) and with economic distance. Economic distance is in turn also highly correlated with the skill differences variables.

[Tables 2 & 3 approximately here]

The first regression results are displayed in table 4. Model 1 only includes the control variables, whereas models 2 to 5 each include a different distance variable. Even after carefully controlling for other factors influencing the magnitude of FDI stocks, we find strong evidence that all four of the CAGE distance dimensions deter FDI. Even economic distance, while being highly correlated with the skill and GDP difference variables of the knowledge-capital model, has an identifiable and significantly negative impact on FDI stocks ($p<0.10$). The final two columns in table 4 display the standardized beta coefficients for model 5, and based on these coefficients, the rank order of the independent variables in terms of their importance in explaining FDI stocks. The sum of the GDPs of the parent and host country has the largest impact on FDI stocks, with geographic distance having the second largest impact. Cultural distance is also very important, ranking 4th among all independent variables. The effects of economic and administrative distance

are relatively small compared to those of many of the other independent variables, but are still significant.

[Table 4 approximately here]

Both cultural and administrative distance are composite indices made up of several components, 4 and 6 respectively. Table 5 shows the effects of each of these components on FDI stocks, allowing us to determine which components are the prime causes of the negative impact of cultural and administrative distance on FDI stocks. We find that the negative impact of cultural distance is caused by absolute differences in uncertainty avoidance, individualism, and masculinity, as the effects of these cultural distance components are all significantly negative ($p<0.01$). Absolute differences in power distance (culdist_pd) have no impact on the magnitude of FDI stocks. The standardized betas indicate that in particular absolute differences in individualism (culdist_ind) deter FDI, with absolute differences in uncertainty avoidance and masculinity playing a secondary role. Turing to the six administrative distance components, we find that differences in political stability (admdist_ps), governance effectiveness (admdist_ge), and regulatory quality (admdist_rq) are statistically significant barriers to FDI, although the effects of such differences are relatively small. Model 3, containing the cultural as well as the administrative distance components, offers further support for these findings.

[Table 5 approximately here]

We can so far conclude that distance still matters, in that all of the CAGE distance dimensions impede FDI. Hence, distance is not (yet) dead, as the strong version of the globalization thesis predicts. However, a somewhat weaker version of the globalization thesis is that even though distance may still matter, its importance is decreasing over time. To gain insight into this issue, we examine whether the negative impact of the CAGE distance dimensions on FDI stocks has become weaker in recent years. Table 6 reports the results for the interaction

effects of the four distance types and a time-trend variable. If these interaction effects contribute significantly to explaining FDI stocks, we can conclude that the effect of the distance dimensions has changed over time. Table 6 shows that all four interaction effects are significant, indicating that the impact of distance has indeed changed over time. Surprisingly, however, the interaction effects are all negative rather than positive, indicating that that the negative relationship between each distance dimension and FDI stocks is stronger for higher values of the time-trend variable, i.e. in more recent years. Hence, instead of dying, the effect of distance seems to grow. The standardized betas indicate that the effects of administrative and geographic distance have increased most over time, followed by those of cultural and economic distance.

[Table 6 approximately here]

To conclude our analyses, we checked the robustness of our findings in two ways. First, we operationalized cultural and administrative distance through a Euclidean distance index (cultdist_eucl and admdist_eucl, respectively) rather than through the Kogut and Singh (1988) index. Second, we examined the absolute and relative impact of the four CAGE distance dimensions using only the even years 1996, 1998, 2000, and 2002 for which Kaufmann et al.'s (2004) administrative quality data are available. Table 7 displays the results of these robustness checks. We find that our earlier findings are very robust to changes in the measurement of two of our key distance indicators as well as to restraints in the sample.

[Table 7 approximately here]

CONCLUSION

In this paper we have examined how the most important types of distances between countries, delineated in Ghemawat's (2001) CAGE distance framework, have affected the magnitude of

countries' bilateral FDI stock during the period 1996-2002. While some have argued that distance would become an ever smaller barrier to international business over time (O'Brien, 1992; Cairncross, 1997), we find that it still matters. Specifically, we find that cultural, administrative, geographic, and economic distance have all remained important barriers to FDI, with all four distance types having a significantly negative impact on FDI stocks. The distance type with the greatest negative impact is geographical distance, followed by cultural distance. Economic and administrative distance have a somewhat smaller, albeit still significant, impact. We also find that the negative impact of cultural distance on FDI stocks is primarily caused by differences in individualism and masculinity, followed by differences in uncertainty avoidance. We also find the negative impact of administrative distance is primarily caused by differences in government effectiveness and regulatory quality, with differences in political stability playing a secondary role.

Interestingly, rather than decreasing over time, the importance of the four CAGE distance dimensions seems to have grown in recent years, suggesting that distance is far from dying but is instead becoming a larger impediment to FDI. Especially administrative distance, while on average still a relatively small barrier, is becoming an increasingly important barrier to FDI, followed by geographic distance. One explanation for this finding is that the rapid technological advancements during the 1996-2002 time period studied in this paper have decreased the necessity for firms to invest in distant locations. For example, these advancements may have lowered the costs of transporting goods around the globe, making it easier for firms to serve distant locations through exports from home rather than through host-country-based affiliates financed with home country funds. Technological advancements may also have made it easier for MNEs to communicate with indigenous firms, thereby reducing the need for MNEs to be physically present in local clusters in distant countries. Similarly, it is also possible that countries

far away from the six parent countries included in our sample (either in cultural, administrative, geographic, or economic terms) have lowered their tariff or non-tariff trade barriers over the 1996-2002 time period studied in this paper, resulting in more exports to and hence less FDI in these distant countries. Still another explanation is that, owing to the increased attention in the media to the phenomenon of globalization, managers of internationalizing firms may have assumed that distance has largely become manageable, leading foreign investments in distant locations to increase over time. However, since our empirical findings show that distance is still a significant barrier to foreign investment, these increased foreign investments may have resulted in higher failure rates, leading the negative impact of distance on countries' FDI stocks to increase over time.

One limitation of our study is that we focus on the outward FDI stocks of six countries that are relatively similar in terms of administrative quality and level of economic development. Consequently, our findings may not be generalizable to developing home countries. Moreover, since our six home countries are relatively similar in terms of administrative quality, the administrative distance to a specific host country is highly correlated with the administrative quality of that country. Hence, it is possible that the negative effect of administrative distance in our sample reflects the effect of the administrative quality of the host country rather than a distance effect. That is, it may be that host-country administrative quality levels rather than differences in administrative quality levels between home and host countries determine the magnitude of bilateral FDI stocks. Unfortunately, our data do not allow us to distinguish between these two possibilities. Since our home countries are also relatively similar in terms of their level of economic development, a similar line of reasoning applies to the effect of economic distance; this effect may reflect that of the level of economic development of the host country. We therefore recommend future studies to include home countries with radically-different

administrative quality and economic development levels in their samples, so to as to determine whether *inter-country differences* in administrative quality and economic development or *host-country levels* of administrative quality and economic development are the main barriers to FDI.

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Table 1. List of host countries included in the sample

Region	Countries included:
Developed (22)	Australia, Austria, Belgium/Luxembourg, Canada, Cyprus, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States
Africa & Middle East (15)	Cote d'Ivoire, Egypt, Ghana, Iran, Israel, Kenya, Mauritius, Morocco, Nigeria, Saudi Arabia, South Africa, Tanzania, Turkey, United Arab Emirates, Zimbabwe
Asia (11)	China, Hong Kong, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Singapore, Sri Lanka, Thailand
Eastern Europe (9)	Bulgaria, Czech Republic, Hungary, Poland, Romania, Russia, Slovak Republic, Slovenia, Ukraine
Latin America (14)	Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Panama, Paraguay, Peru, Uruguay, Venezuela

Table 2. Descriptive statistics

Variable	n	m	s.d
(1) logfdi	2577	3.41	0.56
(2) gdps	2940	3502	3236
(3) gdpd2	2940	18600000	30200000
(4) skd	2862	30.70	37.73
(5) skdgdpd	2862	53962	142812
(6) logfopen_h	2940	2.88	0.96
(7) topen_h	2940	55.15	32.79
(8) skd2topen_h	2862	146371	234176
(9) fopen_p	2940	23.96	17.98
(10) culdist	2772	2.43	1.43
(11) admdist	2940	2.31	2.26
(12) geodist	2940	7110	4538
(13) ecodist	2940	13912	9975

Table 3. Correlation coefficients

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)logfdi	1.00											
(2)gdps	0.31†	1.00										
(3)gdpd2	0.19†	0.93†	1.00									
(4)skd	-0.38†	-0.33†	-0.26†	1.00								
(5)skdgdpd	-0.38†	0.08†	0.15†	0.54†	1.00							
(6)logfopen_h	0.28†	-0.03	0.01	-0.17†	-0.12†	1.00						
(7)topen_h	-0.01	-0.65†	-0.52†	0.22†	-0.21†	0.01	1.00					
(8)skd2topen_h	-0.15†	-0.37†	-0.29†	0.73†	0.11†	-0.06†	0.42†	1.00				
(9)fopen_p	0.15†	-0.21†	-0.03	0.17†	-0.12†	0.08†	0.76†	0.34†	1.00			
(10)culdist	-0.27†	0.02	0.07†	0.29†	0.22†	0.06†	0.05†	0.27†	0.12†	1.00		
(11)admdist	-0.41†	-0.15†	-0.05†	0.62†	0.41†	-0.23†	0.19†	0.54†	0.17†	0.30†	1.00	
(12)geodist	-0.19†	0.25†	0.22†	0.06†	0.15†	0.08†	-0.25†	-0.02	-0.17†	0.06†	0.08†	1.00
(13)ecodist	-0.47†	0.10†	0.24†	0.53†	0.54†	-0.24†	-0.05†	0.31†	0.11†	0.30†	0.70†	0.30†

† $p<0.01$

Table 4. GLS regression estimates of the impact of the CAGE distance dimensions on FDI stocks

	(1)	(2)	(3)	(4)	(5)	Std. Beta	Rank
gdps	$4.94x10^{-5}$ ***	$6.48x10^{-5}$ ***	$6.59x10^{-5}$ ***	$1.32\ x10^{-4}$ ***	$1.34x10^{-4}$ ***	0.774	(1)
	6.25	8.19	8.30	17.33	17.52		
gdpd2	$-8.98x10^{-10}$	$-1.32x10^{-9}$ **	$-1.39x10^{-9}$ **	$-5.79\ x10^{-9}$ ***	$-5.74x10^{-9}$ ***	-0.310	(3)
	-1.36	-2.00	-2.10	-9.28	-9.17		
skd	$6.77x10^{-4}$ **	$7.65x10^{-4}$ ***	$7.57x10^{-4}$ ***	$1.03\ x10^{-3}$ ***	$1.08x10^{-3}$ ***	0.072	(6)
	2.39	2.65	2.61	3.82	4.00		
skdgdpd	$-1.78x10^{-7}$ ***	$-1.34x10^{-7}$ ***	$-1.32x10^{-7}$ **	$-1.57\ x10^{-7}$ ***	$-1.54x10^{-7}$ ***	-0.039	(10)
	-3.33	-2.59	-2.55	-3.26	-3.23		
logfopen_h	$2.27x10^{-2}$ ***	$2.68x10^{-2}$ ***	$2.84x10^{-2}$ ***	$3.21\ x10^{-2}$ ***	$3.28x10^{-2}$ ***	0.056	(8)
	4.52	4.70	4.84	5.40	5.43		
topen_h	$8.81x10^{-4}$ ***	$1.45x10^{-3}$ ***	$1.48x10^{-3}$ ***	$1.55\ x10^{-3}$ ***	$1.62x10^{-3}$ ***	0.095	(5)
	2.84	4.51	4.55	5.05	5.26		
skd2topen_h	$-2.97x10^{-8}$	$6.54x10^{-9}$	$1.27x10^{-8}$	$-3.35\ x10^{-8}$	$-3.79x10^{-8}$	-0.016	(12)
	-0.89	0.19	0.35	-0.95	-1.08		
fopen_p	$2.47x10^{-3}$ ***	$2.43x10^{-3}$ ***	$2.46x10^{-3}$ ***	$2.15\ x10^{-3}$ ***	$2.25x10^{-3}$ ***	0.072	(7)
	8.41	7.57	7.56	6.88	6.97		
culdist		$-5.38x10^{-2}$ ***	$-5.39x10^{-2}$ ***	$-4.56\ x10^{-2}$ ***	$-4.59x10^{-2}$ ***	-0.117	(4)
		-10.58	-10.52	-10.11	-10.39		
admdist			$-3.30x10^{-3}$	$-7.27\ x10^{-3}$ ***	$-7.30x10^{-3}$ ***	-0.029	(11)
			-1.28	-2.88	-2.92		
geodist				$-4.96\ x10^{-5}$ ***	$-4.95x10^{-5}$ ***	-0.401	(2)
				-28.55	-29.28		
ecodist					$-2.43x10^{-6}$ *	-0.043	(9)
					-1.68		
n	2498	2397	2397	2397	2397		
Rho	0.89	0.87	0.87	0.86	0.85		
Wald Chi^2	8688 ***	10267 ***	10208 ***	14103 ***	15070 ***		
Log Likelihood	3511	3211	3196	3346	3304		

GLS AR(1) regression analysis. Z-statistics based on heteroskedasticity-corrected standard errors below the coefficients. Time, parent country and host country fixed effects estimated but not reported.
*** p<0.01; ** p<0.05; * p<0.10

Table 5. GLS regression estimates of the impact of the individual cultural and administrative distance components on FDI stocks

	(1)	Std. Beta	Rank	(2)	Std. Beta	Rank	(3)
gdps	$1.37x10^{-4}$ ***	0.792	(1)	$1.33x10^{-4}$ ***	0.768	(1)	$1.36x10^{-4}$ ***
	18.13			17.21			17.97
gdpd2	$-5.92x10^{-9}$ ***	0.319	(3)	$-5.71x10^{-9}$ ***	0.308	(3)	$-5.93x10^{-9}$ ***
	-9.28			-9.10			-9.35
skd	$1.22x10^{-3}$ ***	0.082	(6)	$1.11x10^{-3}$ ***	0.075	(7)	$1.26x10^{-3}$ ***
	4.50			4.00			4.48
skdgdpd	$-1.71x10^{-7}$ ***	0.044	(11)	$-1.55x10^{-7}$ ***	0.040	(9)	$-1.68x10^{-7}$ ***
	-3.75			-3.19			-3.58
logfopen_h	$3.41x10^{-2}$ ***	0.058	(10)	$3.39x10^{-2}$ ***	0.058	(8)	$3.55x10^{-2}$ ***
	5.50			5.53			5.62
topen_h	$1.69x10^{-3}$ ***	0.099	(5)	$1.55x10^{-3}$ ***	0.091	(5)	$1.62x10^{-3}$ ***
	5.45			5.00			5.16
skd2topen_h	$-3.69x10^{-8}$	0.015	(15)	$-3.86x10^{-8}$	0.016	(15)	$-3.87x10^{-8}$
	-1.04			-1.08			-1.07
fopen_p	$2.45x10^{-3}$ ***	0.079	(8)	$2.36x10^{-3}$ ***	0.076	(6)	$2.53x10^{-3}$ ***
	7.46			7.17			7.55
culdist				$-4.48x10^{-2}$ ***	0.114	(4)	
				-9.80			
admdist	$-7.96x10^{-3}$ ***	0.020	(13)				
	-2.95						
culdist_pd	$6.85x10^{-4}$	0.020	(14)				$7.17x10^{-4}$ *
	1.59						1.66
culdist_ua	$-1.89x10^{-3}$ ***	0.060	(9)				$-1.84x10^{-3}$ ***
	-6.10						-6.03
culdist_ind	$-2.78x10^{-3}$ ***	0.109	(4)				$-2.66x10^{-3}$ ***
	-6.40						-6.00
culdist_mas	$-2.34x10^{-3}$ ***	0.081	(7)				$-2.36x10^{-3}$ ***
	-7.72						-7.87
admdist_va				$-9.90x10^{-3}$	0.014	(16)	$-1.05x10^{-2}$
				-1.40			-1.47
admdist_ps				$-1.35x10^{-2}$ **	0.019	(13)	$-1.38x10^{-2}$ **
				-2.06			-2.07
admdist_ge				$-2.41x10^{-2}$ ***	0.037	(10)	$-2.23x10^{-2}$ ***
				-3.05			-2.74
admdist_rq				$-2.80x10^{-2}$ ***	0.034	(11)	$-2.74x10^{-2}$ ***
				-4.45			-4.36
admdist_rol				$-1.05x10^{-2}$	0.017	(14)	$-1.34x10^{-2}$
				-1.18			-1.49
admdist_coc				$1.04x10^{-3}$	0.002	(17)	$2.02x10^{-3}$
				0.14			0.26
geodist	$-4.98x10^{-5}$ ***	0.404	(2)	$-4.90x10^{-5}$ ***	0.397	(2)	$-4.92x10^{-5}$ ***
	-28.38			-29.07			-28.47
ecodist	$-1.48x10^{-6}$	0.026	(12)	$-1.80x10^{-6}$	0.032	(12)	$-1.02x10^{-6}$
	-1.09			-1.26			-0.77
n	2397			2397			2397
rho	0.84			0.85			0.84
wald chi	16715			15516			17099
LL	3290			3304			3278

GLS AR(1) regression analysis. Z-statistics based on heteroskedasticity-corrected standard errors below the coefficients. Time, parent country and host country fixed effects estimated but not reported.
*** p<0.01; ** p<0.05; * p<0.10

Table 6. GLS regression estimates of the time-varying impact of the CAGE distance dimensions on FDI stocks

	(1)	(2)	(3)	(4)	(5)	(6)	Std. Beta	Rank
gdps	$1.34x10^{-4}$ ***	$1.29x10^{-4}$ ***	$1.29x10^{-4}$ ***	$1.29x10^{-4}$ ***	$1.18x10^{-4}$ ***	$1.17x10^{-4}$ ***	0.676	(1)
	17.52	16.78	16.90	16.73	14.69	14.73		
gdpd2	$-5.74x10^{-9}$ ***	$-5.38x10^{-9}$ ***	$-5.64x10^{-9}$ ***	$-5.25x10^{-9}$ ***	$-4.57x10^{-9}$ ***	$-4.58x10^{-9}$ ***	0.247	(3)
	-9.17	-8.61	-9.07	-8.35	-6.99	-6.97		
skd	$1.08x10^{-3}$ ***	$1.05x10^{-3}$ ***	$1.02x10^{-3}$ ***	$9.43x10^{-4}$ ***	$8.75x10^{-4}$ ***	$9.17x10^{-4}$ ***	0.062	(7)
	4.00	3.93	3.90	3.52	3.42	3.53		
skdgdpd	$-1.54x10^{-7}$ ***	$-1.49x10^{-7}$ ***	$-1.41x10^{-7}$ ***	$-1.83x10^{-7}$ ***	$-1.77x10^{-7}$ ***	$-1.81x10^{-7}$ ***	0.046	(9)
	-3.23	-3.14	-3.06	-3.87	-3.87	-3.90		
logfopen_h	$3.28x10^{-2}$ ***	$3.39x10^{-2}$ ***	$2.90x10^{-2}$ ***	$2.85x10^{-2}$ ***	$2.78x10^{-2}$ ***	$2.63x10^{-2}$ ***	0.045	(10)
	5.43	5.52	4.85	4.76	4.69	4.37		
topen_h	$1.62x10^{-2}$ ***	$1.39x10^{-3}$ ***	$1.45x10^{-3}$ ***	$1.60x10^{-3}$ ***	$1.32x10^{-3}$ ***	$1.32x10^{-3}$ ***	0.077	(5)
	5.26	4.55	4.83	5.23	4.39	4.38		
skd2topen_h	$-3.79x10^{-8}$	$-3.32x10^{-8}$	$-3.97x10^{-8}$	$-3.42x10^{-8}$	$-3.17x10^{-8}$	$-3.80x10^{-8}$	0.016	(16)
	-1.08	-0.96	-1.20	-0.99	-1.00	-1.18		
fopen_p	$2.25x10^{-3}$ ***	$2.34x10^{-3}$ ***	$2.13x10^{-3}$ ***	$1.84x10^{-3}$ ***	$1.83x10^{-3}$ ***	$1.75x10^{-3}$ ***	0.056	(8)
	6.97	7.28	6.77	5.55	5.92	5.34		
culdist	$-4.59x10^{-2}$ ***	$-3.45x10^{-2}$ ***	$-4.54x10^{-2}$ ***	$-4.53x10^{-2}$ ***	$-4.26x10^{-2}$ ***	$-3.75x10^{-2}$ ***	0.096	(4)
	-10.39	-6.77	-10.29	-10.24	-9.32	-7.51		
admdist	$-7.30x10^{-3}$ ***	$-7.77x10^{-3}$ ***	$6.06x10^{-3}$ **	$-6.40x10^{-3}$ **	$-7.92x10^{-3}$ ***	$1.91x10^{-4}$	0.001	(17)
	-2.92	-3.04	2.01	-2.59	-3.43	0.05		
geodist	$-4.95x10^{-5}$ ***	$-4.92x10^{-5}$ ***	$-4.87x10^{-5}$ ***	$-4.61x10^{-5}$ ***	$-4.92x10^{-5}$ ***	$-4.60x10^{-5}$ ***	0.373	(2)
	-29.28	-29.43	-28.90	-24.81	-29.35	-24.96		
ecodist	$-2.43x10^{-6}$ *	$-2.36x10^{-6}$	$-3.52x10^{-9}$	$-1.95x10^{-6}$	$2.50x10^{-6}$ *	$1.02x10^{-6}$	0.018	(15)
	-1.68	-1.63	0.00	-1.40	1.66	0.67		
timetrend	$-4.52x10^{-4}$	$6.00x10^{-3}$ ***	$7.71x10^{-3}$ ***	$7.70x10^{-3}$ ***	$1.36x10^{-2}$ ***	$1.95x10^{-2}$ ***	0.070	(6)
	-0.34	2.91	4.49	3.62	6.84	6.95		
culdist_time		$-2.80x10^{-3}$ ***				$-1.96x10^{-3}$ ***	0.028	(13)
		-4.23				-3.08		
admdist_time			$-3.01x10^{-3}$ ***			$-1.69x10^{-3}$ ***	0.033	(11)
			-6.98			-2.85		
geodist_time				$-9.13x10^{-7}$ ***		$-7.20x10^{-7}$ ***	0.032	(12)
				-4.98		-3.65		
ecodist_time					$-8.33x10^{-7}$ ***	$-2.90x10^{-7}$ **	0.028	(14)
					-8.84	-2.12		
n	2397	2397	2397	2397	2397	2397		
rho	0.85	0.85	0.85	0.85	0.85	0.85		
wald chi	15070	14590	15889	15504	17007	15139		
LL	3304	3304	3308	3327	3338	3328		
Interaction:								
Chi^2		17.9 ***	48.72 ***	24.82 ***	78.21 ***	76.11 ***		
LL Ratio		0.28	9.03 ***	46.26 ***	68.3 ***	48.45 ***		

GLS AR(1) regression analysis. Z-statistics based on heteroskedasticity-corrected standard errors below the coefficients. Time, parent country and host country fixed effects estimated but not reported.
*** p<0.01; ** p<0.05; * p<0.10

Table 7. Robustness checks

	(1)	(2)	(3)
gdps	1.35 x10^{-4} ***	1.55 x10^{-4} ***	1.58 x10^{-4} ***
	17.96	18.75	19.72
gdpd2	-5.78 x10^{-9} ***	-6.83 x10^{-9} ***	-6.97 x10^{-9} ***
	-9.41	-10.09	-10.58
skd	1.12 x10^{-3} ***	1.77 x10^{-3} ***	1.85 x10^{-3} ***
	4.15	5.10	5.44
skdgdpd	-1.51 x10^{-7} ***	-1.78 x10^{-3} ***	-1.77 x10^{-7} ***
	-3.28	-3.34	-3.55
logfopen_h	3.33 x10^{-2} ***	3.42 x10^{-2} ***	3.62 x10^{-2} ***
	5.50	4.25	4.40
topen_h	1.72 x10^{-3} ***	1.71 x10^{-3} ***	1.95 x10^{-3} ***
	5.58	4.58	5.17
skd2topen_h	-4.09 x10^{-8}	-3.34 x10^{-8}	-4.06 x10^{-8}
	-1.18	-0.70	-0.87
fopen_p	2.20 x10^{-3} ***	3.61 x10^{-3} ***	3.56 x10^{-3} ***
	6.79	8.13	7.84
culdist_eucl	-7.36 x10^{-2} ***		-8.43 x10^{-2} ***
	-10.98		-12.38
admdist_eucl	-1.12 x10^{-2} ***		-1.54 x10^{-2} ***
	-3.21		-3.14
culdist		-5.17 x10^{-2} ***	
		-11.34	
admdist		-1.10 x10^{-2} ***	
		-3.16	
geodist	-4.87 x10^{-5} ***	-4.94 x10^{-5} ***	-4.80 x10^{-5} ***
	-29.42	-28.56	-28.84
ecodist	-2.31 x10^{-6}	-8.63 x10^{-6} ***	-9.07 x10^{-6} ***
	-1.62	-4.31	-4.45
n	2397	1371	1371
rho	0.85	0.69	0.68
wald chi	16413	13453	15024
LL	3295	1396	1378

GLS AR(1) regression analysis. Z-statistics based on heteroskedasticity-corrected standard errors below the coefficients. Time, parent country and host country fixed effects estimated but not reported.

*** p<0.01; ** p<0.05; * p<0.10

(1) model with Euclidean distance for cultural and governance distance

(2) model with observations only for years 1996-1998-2000-2002

(3) model with Euclidean distance *and* observations only for years 1996-1998-2000-2002