

# Does transnational terrorism reduce foreign direct investment? Business-related versus non-business-related terrorism

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## Abstract

Although several existing studies examine the economic impact of transnational terrorism by referring to its potential to reduce foreign direct investment (FDI), they overlook possible differences in the effects of business-related and non-business-related terrorism. We argue that the former type of terror negatively affects FDI since it damages multinationals' buildings, destroys their products, kills their employees, and causes a rise in insurance premiums. The latter type of terror, however, does not induce the same ramifications and should thus have little or less influence on a country's FDI. In order to examine the effects of these two different types of transnational terrorism, we employ three different statistical techniques using data gleaned from the International Terrorism: Attributes of Terrorist Events (ITERATE) dataset. A cross-sectional, time-series data analysis of 123 developing countries during the period from 1980 to 2008 reveals that transnational terrorism that harms multinational businesses contributes to a decrease of foreign investment but transnational terrorism that afflicts non-business-related targets is statistically irrelevant. This implies that when countries implement counterterrorism measures that are directly intended to mitigate the impact of business-related terrorist activities, they are likely to attract more foreign capital and should therefore realize a greater degree of economic development.

## Keywords

business terrorism, foreign direct investment, non-business terrorism

Although a plethora of empirical studies regarding the economic impacts of terrorism have been produced since the September 11th 2001 terrorist attacks (e.g. Enders, Sachsida & Sandler, 2006; Li, 2006; Biglaiser & DeRouen, 2007; Mancuso, Dirienzo & Das, 2010), they overlook the possibility that not all terrorism is equally detrimental to economic activity. While some terrorist incidents have the potential to worsen economic conditions, others may not be seen as a cause for concern. In this study we argue that while all terrorist attacks have the capacity to impair a state's overall economic activity, the attacks that actually harm the multinational corporations (MNCs) themselves hold the added potential of killing MNCs' workers, disrupting their production lines, and destroying their buildings and

infrastructure. As a result, MNCs should become more cautious of investing in countries where multinational businesses are frequently terrorized, but they should be less concerned about terrorist incidents that do not directly threaten their business interests. For these reasons, we differentiate between business-related and non-business-related varieties of transnational terrorism using Mickolus et al.'s (2008) International Terrorism: Attributes of Terrorist Events (ITERATE) dataset.

For empirical analysis, we construct a cross-sectional, time-series dataset consisting of 123 developing

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countries from 1980 to 2008. The two separate effects of business-related transnational terrorism and non-business-related transnational terrorism upon the level of FDI are tested with a battery of fixed-effects linear regression models. We also take a number of steps to verify the robustness of our results by employing an alternate measure of transnational terrorism, utilizing a variety of estimation methods and using different sets of controls. The test results provide evidence that business-related terrorism negatively affects a country's ability to attract foreign investment while transnational terrorism that afflicts non-business-related targets has no such effect. This implies that when countries implement counterterrorism measures that are directly intended to decrease business-related terrorist activities, they are likely to attract more foreign capital and therefore foster greater economic development.

### Literature review

Although empirical studies dealing with transnational terrorism and economic variables have increased dramatically within the post-9/11 world, there is still a relative dearth of material concerning the effect that terrorism has upon FDI. More importantly, the empirical results that do exist appear to be inconclusive. While some show a statistically significant and negative effect of terrorism on FDI, others report more ambiguous results, and others fail to find any empirical support. In an attempt to briefly review the current scholarship of transnational terrorism and FDI, our discussion is confined to the findings of several key empirical studies.

In their pioneering work on the transnational terrorism–FDI connection, Enders & Sandler (1996) find evidence that terrorism significantly and substantially reduces the amount of FDI in Spain and Greece. They argue that this detrimental effect is a result of the atmosphere of intimidation and heightened financial risk that transnational terrorism fosters within the affected countries. Abadie & Gardeazabal's (2008) recent study makes a similar observation in that they find that terrorist risk adversely affects a country's ability to attract FDI. Their results show that a standard deviation increase in terrorist risk is associated with a fall in net FDI of about 5% of GDP. Likewise, Lutz & Lutz (2006) examine the effect of terrorism on FDI in 23 Latin American countries between 1969 and 1988 and find that terrorism had a significant, negative impact on inward foreign investment.

Other studies, however, report rather inconclusive results. In an article that examines several different aspects of political violence (i.e. civil wars, external conflict, and terrorism), Blomberg & Mody (2005) find that

when country-pair dummies are included in their model, transnational terrorism harms host country investments, but when country-pair dummies are excluded, the relationship reduces in magnitude and loses significance. The intervention analysis of Enders, Sachida & Sandler (2006) reports similarly ambiguous findings. Their study examines US FDI into 69 host countries and concludes that while transnational terrorism has a statistically significant effect upon US FDI in OECD countries, this effect disappears when the analysis considers non-OECD countries.

While those studies noted above show at least some empirical connection between terrorism and FDI, Li's (2006) study shows no such support. In his analysis, Li differentiates between anticipated terrorism (i.e. terrorism occurring within a country that has a history of terrorist events) and unanticipated terrorism (i.e. terrorism occurring within a country with little to no history of terrorist events) and reports that neither has a direct impact upon FDI, either in terms of investment location or the actual amount of investment.

We suspect that the inconclusive findings noted above may be due to how the extant literature conceptualizes and subsequently operationalizes terrorism. As such, our study offers a refined conceptualization of transnational terrorism that categorizes this phenomenon according to those attacks that are most likely to directly harm business interests versus those attacks that should have little direct impact on MNCs' willingness to invest abroad.

### Why is business-related transnational terrorism so dangerous to business interests?

Before exploring the link between transnational terrorism and foreign investment, we clarify the concept of terrorism as it can mean different things in different contexts. To minimize conceptual discrepancies, we adhere to the definition offered by Enders & Sandler (1999, 2006) in which terrorism is referred to as the premeditated use, or threat of use, of extra-normal violence by non-state actors that is employed to garner a political, economic, religious, or ideological objective through the intimidation of a large audience.

The transnational aspect of terrorism refers to situations in which a terrorist incident in one country involves victims, targets, or perpetrators from another (Enders & Sandler, 2006: 7). As conceived in the literature, transnational terrorism can generally take three forms. The first includes domestic terrorist attacks against foreign targets such as MNCs within or outside the host country. The second is when foreign terrorists

attack a domestic target inside the host country. And the third takes place when foreign terrorists attack some other foreign target inside the host country (Li, 2005: 280; Choi, 2010). This type of terrorism is qualitatively different from that of domestic terrorism since domestic terrorism is homegrown and home-directed with implications solely for the host country.

With this term understood, we can now put forward a conceptual framework that elucidates how business-related transnational terrorism reduces the amount of FDI a country receives. As suggested in the introduction, multinational businesses are unlikely to believe that all terrorist attacks are equally detrimental to their investment opportunities. Instead, MNCs are likely to perceive certain types of terrorist incidents, by virtue of whom or what are attacked, as more dangerous than others, thereby viewing particular countries as less desirable destinations for investment if these states experience these more perilous attacks. What type of terrorism results in this kind of negative consequences for MNCs? We argue that terrorist attacks that strike international businesses are the most FDI-damaging form of terror and that multinationals thus have incentives to eschew investing in locations that are victimized by this type of terrorist activity.

The idea that certain types of terrorism influence multinationals' investment decisions in different ways is both intuitively appealing and implied in the literature. Li (2006: 233), for instance, recognizes this when he states: 'less significant and limited terrorist attacks may have little effect on the expected returns of an investment project'. Further, in a study by Mancuso, Dirienzo & Das (2010), the authors report that different aspects of a country's terrorist risk have varying effects upon the inflow of FDI into that country. They conclude that 'analyses examining the determinants of FDI need to take into consideration the nature of the terrorist risk rather than the overall terrorist risk faced by a country' (p. 790).

Our study elaborates on these insights by arguing that non-business transnational terrorism should have a relatively minor effect upon a country's macroeconomic environment, effectively persuading MNCs that such terrorism is only marginally detrimental to their investment opportunities since it provides no specific threat to multinational businesses' interests or their employees. As such, these types of attacks should have little or less influence on MNCs' operating costs, their insurance rates, or their ability to attract and keep their workers and business managers. There is therefore less reason for MNCs to be concerned about these terrorist incidents since they do not deliberately harm the assets of the company.

In contrast, terrorist attacks that afflict multinational businesses are likely to make foreign investors more alarmed and cautious because they generate a direct damaging effect on investment opportunities and profitability. Indeed, these business-related terrorist attacks directly disrupt business operations and lower productivity by destroying MNCs' building facilities and production lines, damaging the infrastructure they depend upon to conduct business, or making it more difficult to retain managers or other highly skilled workers. These attacks may further dissuade MNCs from investing since they hold the potential to kill or kidnap their employees, increase their operating costs, and raise their insurance premiums (Gaibulloev & Sandler, 2011).

To further elaborate the different impacts of business-related and non-business-related terrorism, we turn to the conceptual framework provided by Dunning's (1988, 1993) eclectic paradigm. According to Dunning's theory, an international firm's decision to invest abroad can be motivated by three sets of advantages. First are 'ownership-specific advantages' of intangible assets such as product innovation, brand names, and marketing techniques. Diversifying their assets across foreign borders allows firms to utilize economies of scale or to foster their monopoly power over their respective industries. The second form of benefits comes from the 'internalization advantages' of hierarchical control over cross-border production. Instead of resorting to outsourcing, trade, or licensing, this type of advantage puts firms in direct control over their production and distribution facilities without needing to appeal to a middleman. The last set of incentives is related to 'location-specific advantages'. These advantages refer to characteristics of the host country, whether they are favorable macro or microeconomic policies, the availability of natural resources, low wage rates, or abundant labor. Given the sizeable payoffs of these advantages with respect to business profits, MNCs are willing to tolerate potential investment risks as long as their business activities are not directly damaged by unfavorable incidents that occur in the host country. However, we argue that MNCs are less willing to invest in another country if the potential liabilities in the new environment outweigh or negate Dunning's three sets of advantages (Li & Resnick, 2003).

By focusing our attention on the differences between business-related and non-business-related terrorism, our conceptual framework attempts to elucidate the circumstances under which MNCs are most likely to be dissuaded from pursuing Dunning's three advantages. Since the first of those three advantages (i.e. ownership-specific advantages) is primarily driven by

firm characteristics (Gastanaga, Nugent & Pashamova, 1998), we have no reason to believe that it is affected by terrorism. However, the effect of terror on the other two advantages is in need of discussion. We believe that business-related transnational terrorism overshadows multinationals' internationalization advantages by making it less appealing for them to place their business facilities directly within a business terrorism-prone country. For instance, Spich & Grosse (2005) show that the costs associated with increased company security efforts affect the competitiveness of internationalizing firms. Therefore, when business-related terrorism is prevalent within a state's borders, it may simply be more profitable for a MNC to utilize outsourcing or licensing since its own facilities will not be put in danger. In countries plagued by frequent incidents of business-related terrorism, MNCs must cope with the possibility that their buildings could be damaged and their employees killed. In addition to the extra money that has to be spent to finance more extensive preventive measures (e.g. hiring more security guards and adding more monitoring devices) and higher insurance premiums, if an attack proves to be successful, the MNC also has to allocate funds to fix the damage done to its property or to help compensate the families of targeted employees (Gaibulloev & Sandler, 2011). Non-business-related terrorism, however, does not raise these same types of concerns since it does not directly threaten a company's facilities or personnel.

We also believe that countries incur a loss in their location-specific advantages when business-related transnational terrorism is prevalent within their borders. When a country is frequently afflicted with business-related terrorism, it becomes more difficult to foster an attractive investment environment for foreign investors who are forced to satisfy the local population's demand for higher salaries under the insecure working environment and who need extra security measures surrounding their production and distribution facilities in the host country. Illustrating this idea, the 'hedonic market approach' contends that markets reflect the indirect utility losses imposed on individuals by terrorist attacks. In explaining this notion, Frey, Luechinger & Stutzer (2007: 15) state: 'Higher wages must be paid to compensate employees for the disamenities incurred by working in a region ridden with terrorism' (see also Frey & Luechinger, 2005). Further, studies have argued that interruptions in international supply chains following business-related terrorist attacks can result in shortages or delays of critical inputs (Czinkota, Knight & Liesch, 2004; Czinkota et al., 2005, 2010). The potential damage that business terror can inflict on supply chains

reduces these countries' location-specific advantages and can dissuade MNCs from investing when this form of terrorism is prevalent. Likewise, other research has argued that terrorism increases the cost of investing in technology and capital formation due to its ability to diminish trust in an economy, striking yet another blow against countries' location-specific advantages (Blomberg, Hess & Tan, 2011). Thus, business-related transnational terrorism is likely to cause multinationals' investment costs to outweigh their location benefits in a *direct* way.

At the same time, the possibility remains that non-business-related terrorist attacks may lessen FDI by propelling the government to enact security policies that work unfavorably toward business interests. However, most of these security precautions should have a relatively small effect on FDI since the public authorities devising them are likely to realize the potentially harmful effects that their interventions may have on FDI and should therefore design these measures in a way that mitigates their negative effect on foreign investments. There may be some exceptional cases in terrorism-prone countries where terrorist operations are heavily financed through illegal business transactions and thus governments introduce strict financial measures that require the close monitoring of entire business transactions to ensure that they do not finance future terrorist activity (Li, 2006). These situations may generate an *indirect* unfavorable effect on countries' overall macroeconomic environments by making it more expensive to conduct business in these locations, lessening international investment and thus attenuating a MNC's *location advantages*. We believe that such a possibility is relatively rare because many developing economies are in great need of foreign capital and consequently have little incentive to introduce severe counterterrorism measures that forsake their ability to foster FDI. Furthermore, even if these security measures have some negative impact on foreign investment in this way, they can also stimulate FDI by lessening the likelihood that foreign businesses and their employees get caught up in the cross-fire of a terrorist attack.

Our conceptual arguments appear to be in line with policy-related reports and books on foreign investment and terrorism prepared by political risk assessment companies and financial advisors. On the one hand, they show that MNCs have a demand for knowledge regarding the amount of business terrorism within a country. For instance, the 1987 Frost and Sullivan Report collected statistics on 85 countries regarding the likelihood that terrorists would target business interests within these

states (Daly, 1987). Similarly, as part of its turmoil risk index, the Political Risk Services Group keeps track of the number of transnational terrorist attacks that are conducted against businesses residing in countries around the world (PRS, 2010). Other risk agencies create profiles of countries' 'security risk' potential that are meant to help businesses 'mitigate the risks of terrorism, and protect their reputation, their staff and their key business assets' (Control Risks, 2010). Likewise, research by the Economist Intelligence Unit found that 50% of executives believe that businesses are now as prevalent a target for terrorist attacks as governments and that these individuals are less likely to invest their FDI dollars where these types of attacks take place (Gettler, 2007).

On the other hand, these policy-related sources also indicate that more attention tends to be placed on the ramifications of business-related as opposed to non-business-related terrorism. In Poole-Robb & Bailey's (2004: 110, 115) study, the authors advise senior management to avoid those countries that pose undue threats to asset security (e.g. security of physical infrastructure, worker safety, business operations) and to determine whether the local population is hostile to foreign businesses before investing. When evaluating the characteristics of terrorist groups, the authors put additional stress on learning whether these groups target foreign businesses. Since business executives can pose tempting targets for economically-driven terrorists, they also warn MNCs to pay particular attention to the risk of kidnappings.

In sum, our conceptual framework and related examples suggest that while business-related transnational terrorism generates direct unfavorable consequences that diminish the amount of foreign investment a country receives, transnational terrorism against non-business targets lacks these same influences and thus has no or less effect on FDI.

*H<sub>1</sub>*: When a country experiences business-related transnational terrorist attacks, it should be less likely to attract foreign investment.

*H<sub>2</sub>*: When a country experiences non-business-related transnational terrorism, it should have little or less difficulty attracting foreign investment.

### Research design: Model building and operationalization

To test the two transnational terrorism hypotheses, we collect pooled panel data on 123 developing countries

during the years 1980 to 2008.<sup>1</sup> We focus on developing countries since the determinants of FDI within them differ from those found in developed countries (Blonigen & Wang, 2005).<sup>2</sup> In addition, following Bütthe & Milner's (2008) study, we drop those states with populations less than 1,000,000 people. These small population states can skew the empirical results and bias the sample since the influx of FDI into their borders often-times results from different structural factors than those found in larger countries. The study period is limited to the years from 1980 to 2008, as 1980 is the first year in which data for FDI are collected and 2008 is the last year that data for transnational terrorism are available. The cross-sectional, time-series data analysis allows us to take advantage of variation in the terrorism data over time and across countries. Using the country year as the unit of analysis, we build an econometric model with the following form:

$$\begin{aligned} FDI_{it} = & \alpha + \beta_1(\text{Business-related International Terrorism}_{it-1}) \\ & + \beta_2(\text{Non-Business-related International Terrorism}_{it-1}) \\ & + \beta_3(\text{Market Size}_{it-1}) + \beta_4(\text{Economic Growth}_{it-1}) \\ & + \beta_5(\text{Economic Openness}_{it-1}) + \beta_6(FDI_{it-1}) \\ & + \beta_7(\text{Interstate Conflict}_{it-1}) + \beta_8(\text{Civil Conflict}_{it-1}) \\ & + \beta_9(\text{Regime Type}_{it-1}) + \beta_{10}(\text{Post-Cold War}_{it-1}) + \varepsilon \end{aligned}$$

#### Dependent variable

FDI, the dependent variable, comes from the United Nations Conference on Trade and Development (UNCTAD) (2010) and represents the net inflow of FDI stocks within a country. FDI stocks are operationally defined as 'the value of the share of capital and reserves (including retained profits) attributable to the parent enterprise, plus the net indebtedness of affiliates to the parent enterprises' (UNCTAD, 2002). To be considered FDI, the investment must acquire a

<sup>1</sup> A list of all the sample countries included in the analysis can be found in Appendix I.

<sup>2</sup> Developed versus developing countries are determined by OECD status. The results with OECD countries show that neither business terrorism nor non-business terrorism affects FDI in a statistically significant manner. These results are not surprising given the fact that large OECD countries are better at deploying security measures and enacting economic policies that can win back investors' confidence (Enders, Sachida & Sandler, 2006). Further, wealthy countries draw their foreign capital inflows from a diverse group of nations and investors and are thus able to better withstand attacks without measurable impacts (Enders & Sandler, 1996).

lasting management interest in a company operating in a foreign country, thus excluding foreign investments that acquire less than 10% of the voting stock of a given enterprise. These types of investments are considered portfolio investments and are qualitatively different from FDI in that they are much more liquid and have a greater capacity to pull out of a country when confronted with risk. FDI connotes an actual ownership of physical capital and thus makes it more difficult to easily break away from the host government (Jensen, 2003). As in other studies that utilize this variable (e.g. Lee & Mansfield, 1996; Dees, 1998; Wei, 2000), FDI stocks, which contain neither zero nor negative values, is natural log transformed to mitigate the possibility of positive skew and to reduce the impact of influential observations.<sup>3</sup>

#### *Main independent variables*

The two main independent variables are count measures of the annual total number of transnational terrorist attacks that afflict business interests versus those that harm non-business interests. Data for these variables come from Mickolus et al.'s (2008) ITERATE dataset, 1968 to 2008. To determine the number of transnational terrorist incidents of this type, we employ ITERATE's 'Type of Immediate Victim' variable that codes each terrorist incident according to who was victimized. The categories offered with this variable are: (1) host government officials, (2) foreign diplomats, (3) host government military, (4) foreign military, (5) corporation officials, (6) opinion leaders, (7) private parties (i.e. tourists, missionaries, students), (8) suspected terrorists, and (9) indeterminate. ITERATE notes that in constructing this variable 'the bombing of an office of a corporation is considered to be psychological, and directed at that corporation's officials and is coded as 5' (Mickolus et al., 2008: 22). Therefore, the terrorist attacks that take on the value of 5 are not limited to only those incidents that claim corporation officials as their victims, but those that damage the physical property of the corporation as well. It is important to note that the value of 5 describes who or what is harmed; it is empirical. If terrorist groups attempted to harm government officials but instead harmed corporate officials, the 'Type of Immediate Victim' would be

'corporate officials' designated by the number 5. Thus, an incident that was intended to strike a government target but yet was experienced by a corporation would be coded as a corporate attack as opposed to a government attack in the ITERATE database. Despite this potential weakness in the data collection process, we believe that terrorists usually hit their mark rather than unintended targets. In the dataset used here, there are 753 business-related terrorist incidents coded from 1968 to 2008. This is the third largest category behind only 'private parties' and 'foreign diplomats' and composes 18.4% of all the transnational terrorist events in the dataset. We expect this variable to have a significantly detrimental effect upon the amount of FDI a country receives.

In order to test Hypothesis 2 and to see how business-related terrorism compares to the non-business variety, we construct an additive index that sums the total number of terrorist incidents in the eight remaining Immediate Victim categories. This variable is not expected to demonstrate a significant effect upon the level of FDI within a country.

#### *Control variables*

To minimize the possibility that our results are subject to omitted variable bias and thus flawed, we include eight control variables that encompass economic, political, and systemic determinants of FDI: market size, economic growth, economic openness, lagged FDI, interstate war, civil war, democracy, and post-Cold War.<sup>4</sup>

The first economically-oriented control variable we include is a country's market size. Larger markets are

<sup>3</sup> To verify the robustness of our findings, we also test an alternative measure of the dependent variable: FDI divided by GDP. These tests do not lead to substantively different conclusions so their results are not reported.

<sup>4</sup> We also test an array of additional control variables that appears in several existing studies: regime durability (i.e. the number of years a country has experienced without going through a regime change, measured as a three-point shift in a country's Polity IV score for a given year), political instability (i.e. an additive index that equals the annual total number of assassinations, strikes, guerrilla wars, government crises, riots, revolutions, and demonstrations that take place within a state's borders; data from Banks, 2004), foreign exchange rate (i.e. the absolute value change in a country's exchange rate; data from the World Development Indicators database; World Bank, 2010), economic development (i.e. gross domestic product per capita, logged), and time dummies. While regime durability and political instability do not achieve significance, the foreign exchange rate and economic development variables exert a significant negative effect. Since these control variables (along with the time dummies) do not affect the significance of the business or non-business terrorism variables, their results are not reported to save space.

likely to attract more FDI since foreign investors can assume they will receive more future returns on their investments (Li & Resnick, 2003). Smaller markets, by contrast, are less able to provide a favorable climate in which investments can grow. This variable is measured by the natural log transformed gross domestic product (GDP) of a country and is expected to increase FDI.

Some existing studies argue that in determining where MNCs choose to invest, the size of a country's economy is not as important as the rate by which it grows (e.g. Schneider & Frey, 1985; Jun & Singh, 1996; Gastanaga, Nugent & Pashamova, 1998). Profit-oriented firms are drawn to environments in which the prospects for market opportunities are seen to be flourishing. This is operationalized through the annual percentage growth rate of GDP; this variable should take on a positive coefficient. Data for the above two control variables come from the United States Department of Agriculture (2011).

The level of FDI within a country also depends on the degree of the country's openness to capital mobility (Abadie & Gardeazabal, 2008). Previous studies have shown that countries that engage in more international trade also have the tendency to attract more FDI (Büthe & Milner, 2008). To measure this variable, we use the Penn World Tables 6.3 where economic openness is measured as the volume of trade (exports plus imports) as a percentage of GDP (Heston, Summers & Aten, 2009). This variable should have a positive influence upon FDI.

The last economic control variable in this analysis is the lagged value of logged FDI. This variable is particularly important for our analysis since FDI stock data can be prone to autocorrelation (Aisbett, 2007). The addition of this variable should mitigate this problem while also controlling for the effect of omitted structural variables (Li & Schaub, 2004). While only a few studies examining the terrorism–FDI link use this modeling strategy, the approach has been recommended in numerous other political science studies (e.g. Burkhart & Lewis-Beck, 1994; Beck & Katz, 1995). This variable should have a positive effect upon FDI.

Economic variables are not the only determinants of FDI. For instance, previous studies dealing with political risk have found that conflict-related variables have a negative effect upon FDI by bringing about governmental policies that are detrimental to international business interests (Blomberg & Mody, 2005; Li, 2006). We include interstate conflict and civil conflict variables to capture political risk within a host country (Li, 2006).

Interstate dispute is a dummy variable coded as 1 if a country is involved in an armed interstate dispute and 0 if it is not. Civil conflict is also a dummy that is coded 1 when a country is engaged in an intrastate conflict and 0 otherwise. Data for both these variables come from Gleditsch et al. (2002).

Another politically-related factor in predicting FDI pertains to the type of regime found with a country (Jensen, 2003; Li & Resnick, 2003). Countries with transparent legal systems and a history of respecting property rights, characteristics often found in democracies, give MNCs reason to believe that their investments will not be expropriated. Further, recent studies have shown that democracies tend to attract more investment than non-democracies (Jensen, 2003; Choi & Samy, 2008; Choi, 2009). The democracy variable ranges from  $-10$  (most autocratic) to  $10$  (most democratic) and is taken from the Polity IV dataset (Marshall & Jaggers, 2010). It should positively influence the level of FDI.

Lastly, certain characteristics of the international system also need to be taken into account when studying the determinants of FDI. Following Biglaiser & DeRouen's (2007) study, a post-Cold War dummy is created in order to capture the increased investment opportunities that emerged after the end of the Cold War. It is coded 1 from 1990 onwards and 0 otherwise. It should show a positive effect.

Since the primary theoretical proposition of this study examines whether the presence of transnational terrorism within countries is a significant determinant of FDI, we conduct 'within' estimations consisting of OLS regression with country fixed-effects. This technique allows us to distinguish between the effects of policy changes and other less variable elements of the investment climate on FDI. Analyses using country-specific fixed-effects models are able to control for unobserved influences that remain constant over time. That is, country fixed-effects allow us to take into account the unique political and economic environments of each country in attracting foreign investors. Furthermore, preliminary Hausman tests suggest that this method is preferable over random-effects models.<sup>5</sup> This empirical technique has been used in many recent analyses studying the determinants of FDI (e.g. Cheng & Kwan, 2000; Jensen, 2003; Büthe & Milner, 2008; Haftel, 2010). To correct for heteroskedasticity that is often present in

<sup>5</sup>  $\text{Chi2}(9) = 103.95; \text{Prob} > \text{Chi2} = 0.00.$

Table I. The effect of transnational terrorism on foreign direct investment, 1980–2008

Variable	Country fixed-effects regression			
	Model 1	Model 2	Model 3	Model 4
Terrorism	−0.004* (0.002)			
Business terrorism		−0.004** (0.001)		−0.002* (0.001)
Non-business terrorism			−0.005 (0.003)	−0.005 (0.003)
Market size	0.336** (0.112)	0.338** (0.113)	0.335** (0.112)	0.336** (0.112)
Economic growth	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Economic openness	0.001** (4.31e−4)	0.001** (4.36e−4)	0.001** (4.30e−4)	0.001** (4.31e−4)
Lagged FDI	0.836*** (0.0430)	0.837*** (0.043)	0.836*** (0.043)	0.836*** (0.043)
Interstate war	0.019 (0.025)	0.018 (0.025)	0.020 (0.025)	0.019 (0.025)
Civil war	0.008 (0.028)	0.003 (0.028)	0.009 (0.028)	0.009 (0.028)
Democracy	0.005 (0.003)	0.005 (0.003)	0.005* (0.003)	0.005 (0.003)
Post-Cold War	0.075** (0.029)	0.076** (0.029)	0.075** (0.029)	0.075** (0.029)
Constant	−4.384** (1.839)	−4.460** (1.855)	−4.360** (1.830)	−4.369** (1.831)
F-test statistic	875.02	872.07	876.43	819.36
Prob > F-test statistic	0.000	0.000	0.000	0.000
R-squared				
within	0.9365	0.936	0.937	0.937
between	0.9695	0.969	0.969	0.970
overall	0.9598	0.959	0.960	0.960
n	123	123	123	123
N	2,690	2,690	2,690	2,690

Robust standard errors reported in parentheses (clustered over countries).

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

pooled panel data, we also employ Huber-White robust standard errors clustered over countries.

## Empirical results

### Basic analysis

Table I reports the results of four fixed-effects regression models.<sup>6</sup> Since the theoretical expectations of our terrorism variables are directional, we employ one-tailed tests at the 0.05, 0.01, and 0.001 levels to determine significance. The first model does not differentiate business-related terrorism from non-business-related terrorism, so it examines the contention that both business and non-business terrorist attacks may be threatening to business interests. Similar to several previous studies (e.g. Enders & Sandler, 1996), the results in Model 1 indicate that transnational terrorism is a contributing factor in reducing foreign investment. However, the results fail to examine if the driving force behind the decrease of foreign investment is due to business- or non-business-related terrorism. The subsequent three models are built to probe into this issue. The second

model examines the impact of business-related transnational terrorism upon FDI, the third considers the effect of non-business-related transnational terrorism, and the fourth examines the relative impact of business terrorism and non-business terrorism in the same model.

The results in Models 2 to 4 provide support for our theoretical expectations discussed above. For instance, the business terrorism variable in Model 2 has a statistically significant and negative impact on FDI within a country ( $p < 0.01$ ). When countries experience transnational terrorist attacks that victimize MNCs, the amount of FDI these states can expect to receive decreases. In contrast, the non-business terrorism variable in Model 3, although taking on a negative sign, does not generate a statistically meaningful impact upon a country's ability to induce foreign investment. This suggests that when a country is afflicted with transnational terrorist attacks that target entities *other than* multinational businesses, the attacks do not lead to a decrease of FDI. This same situation also holds in Model 4. In this model, the business- and the non-business-terrorism variables are in competition with each other, along with the other eight FDI-related control variables. In this combined model, business terrorism continues to be significant ( $p < 0.05$ ) and in the

<sup>6</sup> A correlation matrix can be found in Appendix II.



hypothesized direction while non-business terrorism remains insignificant.<sup>7</sup>

The results of the control variables in Models 2 to 4 are relatively straightforward. Of the variables that reach significance (i.e. market size, economic openness, lagged FDI, and post-Cold War), all exert an influence in the hypothesized direction. Market size is significant at the 0.01 level and positive, indicating that countries with larger economies are better equipped to attract FDI. Economic openness is also significant at the 0.01 level and positive, providing support for the notion that countries that trade more are more appealing venues for FDI. Post-Cold War is significant at the 0.001 level and positive, illustrating the increase in investment opportunities that opened up after the collapse of the Soviet Union. Lastly, lagged FDI is highly significant ( $p < 0.001$ ) and positive, suggesting that the previous year's foreign investment affects the current year's. Given this variable's high significance and large substantive effects (i.e. a 1% increase in FDI in year  $t-1$  produces a 0.84% increase in FDI in year  $t$ ), the results from the business terrorism variable seem even more impressive. In fact, it is worth noting that a lagged dependent variable is often left out of the right-hand side of an equation since it tends to account for a large portion of the dependent variable's variation (Achen, 2000). Economic growth, interstate war, civil

war, and democracy fail to reach significance across models despite the fact that these variables are often cited as correlates of FDI in the existing literature. We speculate that the insignificance of these variables may be due to the addition of the business-related terrorism variable or to the fact that most studies that model the link between transnational terrorism and FDI rarely include a lagged dependent variable.

While attaining statistical significance is an essential factor in determining the importance of independent variables, passing this milestone does not ensure that these variables have a meaningful influence over the dependent variable in a substantive sense. To specifically determine the extent to which these factors influence the dependent variable, researchers should also report the degree to which the dependent variable is affected by the independent variable. In this spirit, it is telling to note that the amount of FDI countries lose from business-related terrorism is quite substantial. For instance, in the combined Model 4 in Table I, the coefficient for business terrorism is  $-0.002$ . Since the FDI variable is log transformed, this translates into a negative 0.2% change in FDI for every additional business-related terrorist attack. Because the average amount of FDI for any given year in our dataset is approximately \$7.9 billion, this negative 0.2% change results in an approximate loss of \$15.8 million for every business-related terrorist incident. To better show the extent of how business-related terrorism can affect a particular country, we consider the case of Columbia. Columbia, with 171 business-related terrorist attacks, is the state most affected by this form of terror. Columbia also attracts about \$3.7 billion more FDI every year than the average country in the sample (i.e. \$11.6 billion). Within the context of this country, every business-related terrorist attack therefore decreases its FDI by about \$23.2 million. Over the time frame of the entire sample, this amounts to a total of approximately \$4 billion of FDI being lost to business-related terrorist attacks.

<sup>7</sup> As another robustness test, we also added an interaction term between business- and non-business terrorism to Model 4. In this extended model, none of the terrorism variables are statistically different from zero. It should be noted, however, that the terrorism interaction term is highly correlated with business terrorism (i.e. 0.90). We suspect that this high correlation may be the culprit in attenuating the significance of the business terrorism variable.

It is possible that business-related *domestic* terrorism may also reduce FDI. If domestic terrorist groups are known to attack domestic businesses, MNCs may see themselves as future victims if they invest in the country. Based on the Global Terrorism Database (GTD), we attempt to test the effects of business domestic versus non-business domestic terrorism. When the variables are included in separate models, they both exert a negative effect and are significant at the  $p < 0.01$  and  $p < 0.05$  levels, respectively. When the two variables are included in the same model, neither reaches significance. It must be noted, however, that it is unclear whether the effects we uncover in these models are due to the influence of domestic or transnational terrorism. This is due to the fact that the GTD combines acts of domestic terrorism with incidents of transnational terrorism (for more detailed information on the GTD, see LaFree & Dugan, 2007).

Since this study focuses on the causal direction from business-related terrorism to foreign investment, our empirical models do not consider the possibility that transnational terrorism is sometimes triggered by the presence of FDI in a country. This endeavor is left for future research partly due to the lack of an appropriate estimation method that can treat count measures as endogenous variables.

### *Robustness analysis*

How sure can we be of the negative effect of business-related transnational terrorism upon FDI? Could this negative effect merely be an artifact of the variables used or the estimators employed? This section takes these concerns into account in a number of ways. First, it substitutes the event count measure of transnational terrorism with an indicator of terrorism that takes the severity of these acts into consideration. Second, it employs two alternative model specifications, one that controls for

Table II. The effect of transnational terrorist casualties on foreign direct investment, 1980–2008

Variable	Country fixed-effects regression		
	Model 1	Model 2	Model 3
Business terror casualties	−0.002* (0.001)		−0.002* (0.001)
Non-business terror casualties		−2.13e-5 (1.16e-4)	−1.38e-5 (1.15e-4)
Market size	0.340** (0.113)	0.340** (0.113)	0.340** (0.113)
Economic growth	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Economic openness	0.001** (4.36e-4)	0.001** (4.35e-4)	0.001** (4.36e-4)
Lagged FDI	0.837*** (0.043)	0.837*** (0.043)	0.837*** (0.043)
Interstate war	0.018 (0.025)	0.019 (0.025)	0.018 (0.025)
Civil war	0.001 (0.028)	0.001 (0.028)	0.001 (0.028)
Democracy	0.005 (0.003)	0.005* (0.003)	0.005* (0.003)
Post-Cold War	0.074** (0.029)	0.074** (0.029)	0.074** (0.029)
Constant	−4.506** (1.860)	−4.498** (1.859)	−4.506 (1.860)
F-test statistic	872.48	866.66	785.93
Prob > F-test statistic	0.000	0.000	0.000
R-squared			
within	0.937	0.937	0.937
between	0.969	0.969	0.969
overall	0.959	0.959	0.959
n	123	123	123
N	2,689	2,689	2,689

Robust standard errors reported in parentheses (clustered over countries).

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

random-effects and a second that accounts for the autoregressive nature of the FDI data.

While the first table in our analysis uses yearly aggregate count measures of business and non-business transnational terrorism, there are other ways to measure the presence of terrorist activity. One of these ways is through the construction of a variable that takes into account the number of casualties inflicted from terrorist violence (i.e. number of people killed by terrorism plus the number of people wounded). This alternate measure is beneficial for two reasons: (1) instead of treating all terrorist incidents equally without accounting for their destructiveness or lethality, this measure takes the severity of terrorist attacks into account and allows us to avoid the assumption that terrorist incidents that produce no casualties are commensurable to terrorist incidents that kill or wound hundreds of people; and (2) this measure captures the recent trend in transnational terrorism attacks in which their overall number is decreasing but their lethality is becoming more acute (Frey & Luechinger, 2005; Crain & Crain, 2006; Frey, Luechinger & Stutzer, 2007). If our theoretical argument is correct and if our previous results are robust, business terrorist *casualties* should continue to exert a negative influence over FDI. Table II therefore examines whether the results reached in the prior models

hold up when transnational terrorism is measured by the number of casualties these attacks inflict.

The overall results reported in this table mirror those found in Table I. Model 1 shows that business transnational terrorism continues to have a statistically significant and negative effect upon FDI even when the variable is measured by the number of casualties from business terrorism rather than through an event count measure. Like its counterpart in Table I, Model 2 in Table II fails to show a significant relationship between non-business terrorism and FDI. These results are also confirmed in the combined Model 3. While business terrorism proves to exert a significant and negative effect, the impact of non-business terrorism remains irrelevant in a statistical sense. Furthermore, the direction and significance levels of the control variables in Table II remain unchanged from those reported in Table I. Stated simply, the negative effect of business transnational terrorism upon FDI is robust to various operationalizations of the terrorism variable.

The results in Tables I and II are obtained while controlling for country fixed-effects. However, some previous studies rely on random-effects models as an alternative or a complement to fixed-effects models. These models are attractive in that they do the job of both fixed-effects and between-effects models. In other words,

the random-effects estimator is a weighted average of these two types of statistical tests. One therefore uses random-effects models when there is an expectation that some omitted variables may be constant over time but vary between cases (e.g. a country's proximity to a heavy FDI exporter), and others may be fixed between cases but vary over time (e.g. the systemic increase of FDI in recent decades). In this sense, random-effects models are a more efficient estimator (i.e. provide more accurate  $p$  values) than fixed-effects models. Nevertheless, for the use of random-effects models to be justified, they also must give consistent estimates. As we noted in the research design section, however, the fixed-effects models produce more consistent estimates than the random-effects model, as illustrated by the Hausman test. Despite this finding, Models 1 through 3 in Table III present the results when the tests specify random- as opposed to fixed-effects. Although these tests are not definitive, they do offer a further test of robustness for our results. Stated simply, all three models provide support for our hypotheses: while business-related terrorism significantly reduces FDI, non-business terrorism does not.

Existing research indicates that when MNCs choose to invest in a country, their decisions are generally long-lasting. In other words, once a country is chosen as an investment destination, its foreign investment volume remains relatively stable. This may result from the fact that some countries are just generally better at attracting foreign investors (Haftel, 2010) or that the choice to invest in foreign markets represents something of a sunk cost that can be difficult to reverse. This situation can pose a problem for empirical analyses since it violates the OLS assumption that the observations in year  $t$  are independent from the observations in year  $t-1$ . This state of affairs may be particularly troublesome for our analysis, since FDI stocks have been shown to demonstrate higher levels of autocorrelation than FDI flows (Aisbett, 2007). To determine if this does in fact apply, we employ Woolridge's statistic, a method used in panel data that tests the presence of first-order autocorrelation. This test rejects the null hypothesis of no first-order correlation, indicating that serial correlation is present in our data.<sup>8</sup> Although the lagged dependent variable helped us to address this issue in the previous models, we further correct for this problem by using a statistical technique that is specifically designed to

remedy autocorrelation, namely, generalized estimating equations (GEEs).<sup>9</sup>

Models 4 through 6 of Table III test the effects of our transnational terrorism variables and the eight control variables by using GEE population-averaged models with semi-robust standard errors clustered over countries. Model 4 shows that business terrorism continues to exert a statistically significant and negative effect upon FDI ( $p < 0.001$ ) even after the issue of autocorrelation is more properly addressed. Likewise, Model 5 shows that the effect of the non-business terrorism variable is still insignificant, a finding consistent with those reported in the previous tables. The combined Model 6 confirms the findings in the previous two models and indicates that while business terrorism significantly reduces FDI, non-business terrorism has no noticeable effect.

## Conclusion

We began this study by positing that the inconclusive findings regarding the transnational terrorism-FDI link in the existing literature may be related to the possibility that all terrorist incidents are not equally detrimental to economic activity. We then underlined the importance of differentiating the effects of business-related transnational terrorism from non-business-related transnational terrorism when studying determinants of foreign investment. We argued that while transnational terrorism that does not target MNCs may influence governments' policies towards foreign capital, this does not specifically tell foreign investors exactly how much of a threat transnational terrorism is to investment opportunities and profitability. The number of terrorist incidents directed at multinational business interests, however, gives MNCs this knowledge. This business-related terrorism provides multinationals with a direct and specific marker of the probability that their own business interests will fall victim to terrorist violence.

We tested the above argument through an analysis of cross-sectional, time-series data spanning 123 countries during the period from 1980 to 2008. By performing a battery of tests that utilized an alternate measure of transnational terrorism and several statistical techniques,

<sup>8</sup>  $F(1, 121) = 63.417$ ;  $\text{Prob} > F = 0.000$ .

<sup>9</sup> The GEE approach is a population-averaged method that helps correct for autocorrelation in data by modeling the marginal expectation of the dependent variable as a function of the covariates. Correcting for autocorrelation by using GEE models is most appropriate when one is interested in estimating the effect of changes in covariates across groups or subpopulations (Zorn, 2001). Since our study is concerned with the effect of transnational terrorism on FDI across a wide range of countries, the use of GEE models is a natural choice. For a more in-depth review of GEEs, see Zorn (2001).

Table III. The effect of transnational terrorism on foreign direct investment, 1980–2008: robustness analysis

Variable	Generalized estimating equations					
	Random effects					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Business terrorism	-0.004*** (0.001)		-0.002* (0.001)	-1.40e-4*** (3.21e-5)		-1.23e-4*** (3.60e-5)
Non-business terrorism		-0.004 (0.003)	-0.004 (0.003)		-7.60e-5 (0.000)	-4.8e-5 (0.000)
Market size	0.099*** (0.029)	0.100*** (0.029)	0.100*** (0.029)	0.002 (0.001)	0.002 (0.001)	1.64e-3 (0.001)
Economic growth	4.22e-4 (0.001)	4.07e-4 (0.001)	4.02e-4 (0.001)	-7.86e-6 (3.91e-5)	-7.08e-6 (3.91e-5)	-8.01e-6 (3.91e-5)
Economic openness	0.001*** (2.59e-4)	0.001*** (2.56e-4)	0.001*** (2.57e-4)	1.33e-5 (1.71e-5)	1.33e-5 (1.71e-5)	1.32e-5 (1.71e-5)
Lagged FDI	0.899*** (0.028)	0.899*** (0.028)	0.898*** (0.028)	0.045*** (0.001)	0.045*** (0.001)	0.045*** (0.001)
Interstate war	-0.007 (0.027)	-0.005 (0.027)	-0.005 (0.027)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
Civil war	-0.033 (0.024)	-0.028 (0.024)	-0.027 (0.024)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)
Democracy	0.004** (0.002)	0.004** (0.002)	0.004** (0.002)	0.000*** (7.96e-5)	0.000*** (8.07e-5)	0.000*** (8.07e-5)
Post-Cold War	0.099*** (0.022)	0.096*** (0.022)	0.097*** (0.022)	0.003** (0.001)	0.003** (0.001)	0.003** (0.001)
Constant	-0.185 (0.180)	-0.189 (0.182)	-0.193 (0.182)	2.057*** (0.010)	2.057*** (0.010)	2.057*** (0.010)
Wald chi2	39920.74	39450.82	40671.13	16232.60	15798.91	16178.66
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000
R-squared						
within	0.934	0.934	0.934	n/a	n/a	n/a
between	0.995	0.995	0.995	n/a	n/a	n/a
overall	0.980	0.980	0.980	n/a	n/a	n/a
n	123	123	123	123	123	123
N	2,690	2,690	2,690	2,690	2,690	2,690

Robust standard errors reported in parentheses (clustered over countries) for random-effects models.

Semi-robust standard errors reported in parentheses for the GEE models.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

we uncovered the hypothesized negative effect of business-related transnational terrorism on FDI. The hypothesized insignificant effect of non-business-related transnational terrorism was also substantiated. Put differently, by separating the types of terrorist attacks that are the most likely to affect business interests from those that have little influence over MNCs' decisions to invest abroad, our study more accurately modeled transnational terrorism's impact upon the worldwide distribution of FDI. This implies that when counterterrorism measures aim to specifically decrease business-related terrorist activities as opposed to terrorism in general, they are likely to be more effective in inducing foreign capital and should therefore be in a better position to foster greater economic development.

Future studies dealing with this topic should attempt to further advance our findings through different operationalizations of business transnational terrorism or through different research designs. For instance, a promising line of research would be to extend our argument to the dyadic level of analysis. Research of this nature could tell us if MNCs, in addition to being sensitive to a country's overall level of business terrorism, are also concerned with business terrorism that harms enterprises originating from their home country. For instance, a MNC from Canada may be hesitant to invest in the USA if Canadian-based enterprises in the country are attacked by terrorists on a regular basis; if, however, terrorist groups in the USA only target MNCs from France, they may not believe that their financial interests will be threatened. Researchers should also make a more concerted effort to disaggregate their terrorism measures to account for the possibility that different forms of terrorism affect FDI in different ways. We hope that this research serves as a first step in advancing this line of inquiry.

### Data replication

The dataset, do-file, and log-file for the empirical analysis can be found at <http://www.prio.no/jpr/datasets>. Stata I/C 10.1 was used to derive the statistical results for this article.

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## Appendix I. List of sample countries

Afghanistan	Guinea	Pakistan
Albania	Guinea-Bissau	Panama
Algeria	Haiti	Papua New Guinea
Angola	Honduras	Paraguay
Argentina	Hungary	Peru
Armenia	India	Philippines
Azerbaijan	Indonesia	Poland
Bangladesh	Iran	Romania
Belarus	Israel	Russia
Benin	Ivory Coast	Rwanda
Bolivia	Jamaica	Saudi Arabia
Botswana	Jordan	Senegal
Brazil	Kazakhstan	Sierra Leone
Bulgaria	Kenya	Singapore
Burkina Faso	Kuwait	Slovak Republic
Burundi	Kyrgyzstan	Slovenia
Cambodia	Laos	South Africa
Cameroon	Latvia	South Korea
Central African Republic	Lebanon	Sri Lanka
Chad	Lesotho	Sudan
Chile	Liberia	Swaziland
China	Libya	Syria
Columbia	Lithuania	Taiwan
Congo Brazzaville	Macedonia	Tajikistan
Congo Kinshasa	Madagascar	Tanzania
Costa Rica	Malawi	Thailand
Croatia	Malaysia	Togo
Cuba	Mali	Trinidad and Tobago
Czechoslovakia	Mauritania	Tunisia
Dominican Republic	Mauritius	Turkmenistan
Ecuador	Mexico	Uganda
Egypt	Moldova	Ukraine
El Salvador	Mongolia	United Arab Emirates
Eritrea	Morocco	Uruguay
Estonia	Mozambique	Uzbekistan
Ethiopia	Namibia	Venezuela
Gabon	Nepal	Vietnam
Gambia	Nicaragua	Yemen
Georgia	Niger	Yugoslavia
Ghana	Nigeria	Zambia
Guatemala	Oman	Zimbabwe

## Appendix II. Correlation matrix

	<i>FDI</i>	<i>Terror</i>	<i>Business Terror</i>	<i>Non-Business Terror</i>	<i>Market Size</i>	<i>Econ Growth</i>	<i>Econ Openness</i>	<i>Lagged FDI</i>	<i>Interstate War</i>	<i>Civil War</i>	<i>Democracy</i>	<i>Post-Cold War</i>
FDI	1.00											
Terror	0.07	1.00										
Business terror	0.06	0.73	1.00									
Non-business terror	0.06	0.91	0.38	1.00								
Market size	0.71	0.17	0.10	0.17	1.00							
Econ growth	0.16	-0.04	-0.03	-0.04	0.10	1.00						
Econ openness	0.18	-0.13	-0.06	-0.14	-0.06	0.07	1.00					
Lagged FDI	0.99	0.07	0.06	0.06	0.70	0.16	0.17	1.00				
Interstate war	0.04	0.07	0.02	0.08	0.11	0.02	-0.11	0.04	1.00			
Civil war	-0.01	0.30	0.14	0.31	0.11	-0.06	-0.22	0.00	0.10	1.00		
Democracy	0.25	0.06	0.04	0.05	0.15	0.02	0.03	0.24	-0.03	0.01	1.00	
Post-Cold War	0.27	-0.12	-0.04	-0.14	0.05	0.07	0.21	0.26	-0.06	-0.06	0.30	1.00