

Effects of Terrorism on Foreign Direct Investment: A Cross-country Analysis over Time

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Research Question

- **Do terrorist incidents impact foreign direct investment inflows?**
 - Does the impact of terrorist incidents on foreign direct investment inflows vary depending on what these incidents target (ex.: transportation and private citizen's property)?
 - Do the different ways of measuring terrorism, such as property damage and number of casualties alter the results about the impact of terrorism on foreign direct investment inflow?

Global Terrorism Database - Inclusion Criteria

3 of the following attributes:

- The incident must be intentional (conscious calculation on the part of a perpetrator)
- The incident must entail some level of violence or immediate threat of violence
- The perpetrators of the incidents must be sub-national actors

At least 2 of the following criteria:

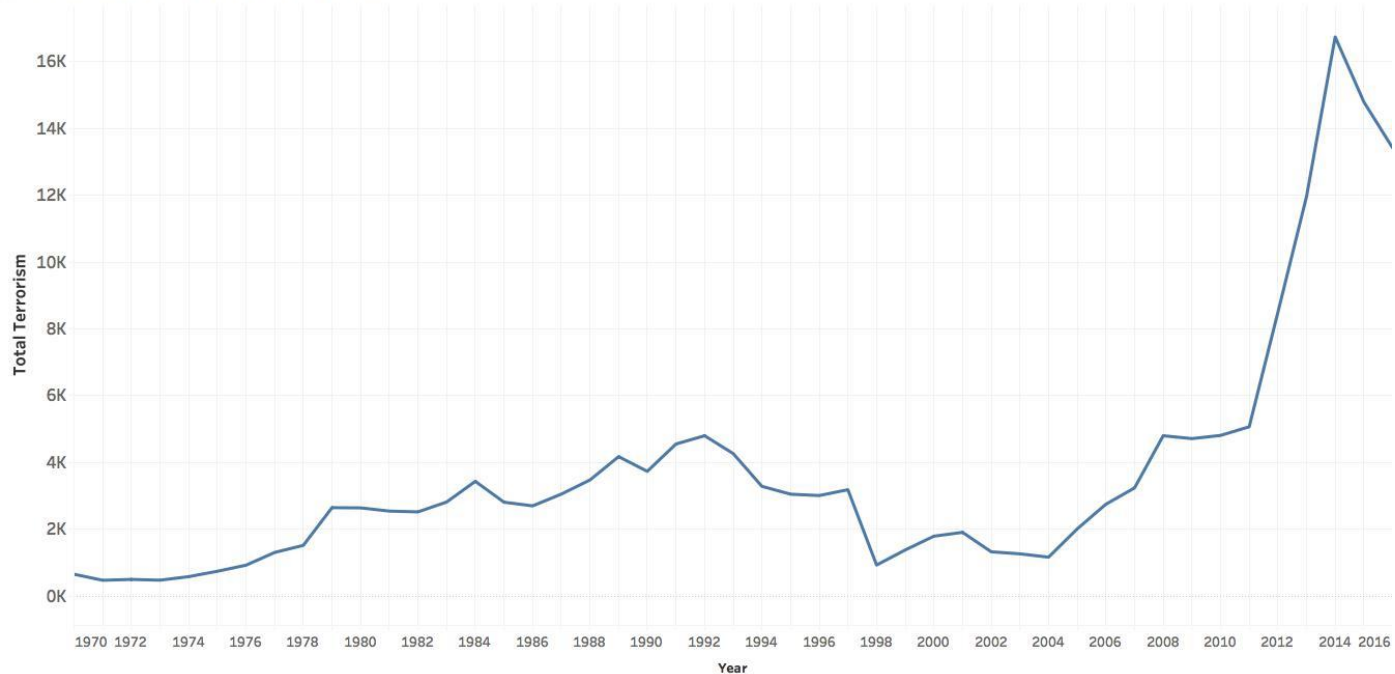
- The act must be aimed at attaining a political, economic (not pursuit of profit but more systematic economic change), religious, or social goal
- There must be evidence of an intention to coerce, intimidate, or convey some other message to a larger audience than the immediate victims
- The action must be outside the context of legitimate warfare activities (must be outside the parameters permitted by international humanitarian law)

Motivation of the Study

- **Foreign Direct Investment Inflow and Terrorism**
 - Enhanced uncertainty which limits investments and diverts FDI to safer locations
 - Increased cost of doing business through higher wages, larger insurance and security costs, which in turn decrease profits, productivity, and growth
 - Impact on specific FDI industries such as tourism, business, government, transportation, etc.
- **Terrorism vs other natural or technological disasters (Ahern 2018)**
 - Only terrorist attacks are intentionally committed violence by other people
 - Psychological impact on economic outcomes
 - Substantially larger impact on macroeconomic outcomes than accidental disaster

Terrorism Incidents Worldwide

Terrorism Trend, 1970-2016



The trend of sum of Total Terrorism for Year.

Regression Model

$$\begin{aligned} \text{LogFDI}_{it} = & \beta_0 + \beta_1 \text{TotalTerrorism}_{it} + \beta_2 \text{GDP}_{it} + \beta_3 \text{GDPpc}_{it} + \beta_4 \text{Population}_{it} + \\ & \beta_5 \text{Trade}_{it} + \beta_6 \text{ExchangeRates}_{it} + \beta_7 \text{Inflation}_{it} + \beta_8 \text{OilProduction}_{it} + y_t + t + a_i + u_{it} \end{aligned}$$

Summary Statistics (if in the base regression)

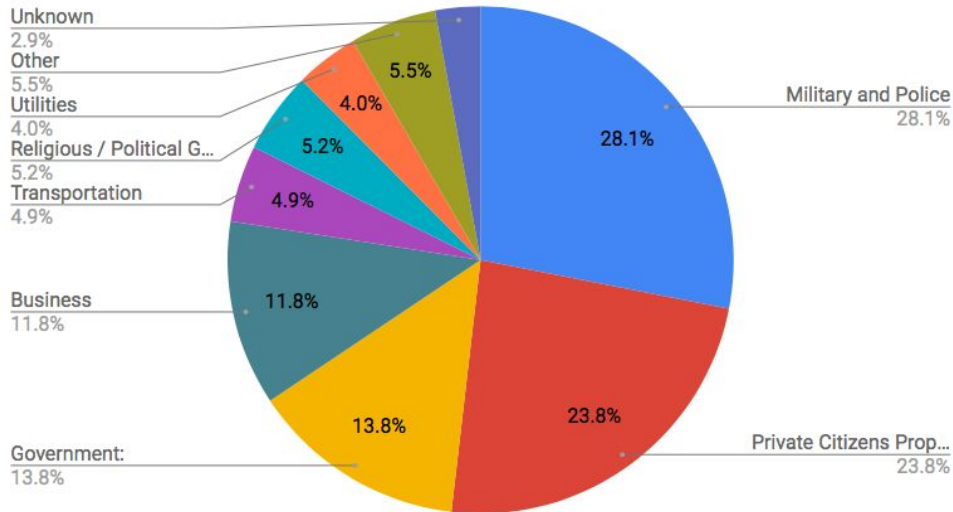
	Mean	Std. Dev.	Min	Max	Obs
log FDI	24.49	0.24	23.02	27.03	4,524
Total Terrorism	24.24	108.71	0.00	2849.00	4,524
GDP per Capita	7844.60	13156.41	94.27	119225.40	4,524
GDP current dollars in Billions	258.83	1152.72	0.04	18624.47	4,524
Population in Millions	41.30	145.35	0.06	1378.67	4,524
Trade	80.96	52.53	0.17	531.74	4,524
Exchange Rates	409.11	1786.42	0.00	25000.00	4,524
Inflation	35.82	485.32	-31.57	26762.02	4,524
Oil Production	516.21	1559.13	-24.00	15116.66	4,524

Base Regression with Fixed Effects and Time Trend

(1)	
VARIABLES	Log(FDI)
Total Terrorism in Hundreds	-0.00437** (2.14e-05)
GDP in Billions	0.000129*** (3.62e-06)
GDP per Capita In Thousands	0.00515*** (0.000347)
Population in Millions	0.00121*** (9.86e-05)
Trade	0.000584*** (8.60e-05)
Exchange Rates In Hundreds	-0.000135 (0.000161)
Inflation In Hundreds	-0.000276 (0.000377)
Oil Production In Hundreds	0.00305*** (0.000510)
Year	0.00204*** (0.000611)
Constant	20.30*** (1.217)
Observations	4,524
Adjusted R-squared	0.762
Time Trend & Year Dummies	Yes
Fixed Effects	Yes
*** p<0.01, ** p<0.05, * p<0.1	

Target Type

Terrorism by Target Type, 1970-2016



- Military and Police
- Private Citizen's Property
- Government: Government General and Government Diplomatic
- Business Transportation: Transportation, Airports & Aircraft and Maritime
- Religious / Political Groups: Religious Figures, Violent Political Party and Terrorists Militia
- Utilities: Telecommunication and Utilities
- Other: Other, NGO, Journalists and Media, Education Institution, Food and Water, Abortion Related and Tourists
- Unknown

Target Types

[illegible]

First Robustness Check - Number of Casualties & Property Value

VARIABLES	(1) Log(FDI)	(2) Log(FDI)	(3) Log(FDI)
Total Terrorism In Hundreds	-0.00437** (2.14e-05)		
Casualties in Thousands		-0.000181 (0.000282)	
Prop Value in Millions			-0.000131*** (3.86e-05)
Population in Millions	0.00121*** (9.86e-05)	0.00117*** (9.61e-05)	0.00117*** (9.58e-05)
Trade	0.000584*** (8.60e-05)	0.000589*** (8.60e-05)	0.000590*** (8.59e-05)
Exchange Rates in Hudnreds	-0.000135 (0.000161)	-0.000132 (0.000161)	-0.000131 (0.000161)
Inflation In Hundreds	-0.000276 (0.000377)	-0.000292 (0.000377)	-0.000295 (0.000377)
Oil Production In Hundreds	0.00305*** (0.000510)	0.00301*** (0.000509)	0.00304*** (0.000509)
Year	0.00204*** (0.000611)	0.00203*** (0.000611)	0.00203*** (0.000610)
Constant	20.30*** (1.217)	20.30*** (1.218)	20.30*** (1.216)
Observations	4,524	4,524	4,524
Adjusted R-squared	0.762	0.762	0.762
Time Trend & Year Dummies	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes

*** p<0.01, ** p<0.05, * p<0.1

Second Robustness Check – Recession

VARIABLES	(1) Log(FDI)	(2) Log(FDI)	(3) Log(FDI)
Total Terrorism in Hundreds	-0.00437** (-2.041)	-0.00936*** (-3.265)	0.00599 (0.910)
GDP in Billions	0.000129*** (35.63)	0.000157*** (32.89)	0.0000603** (2.234)
GDP per Capital in Thousands	0.00515*** (14.87)	0.00622*** (14.51)	0.00218 (1.044)
Population in Millions	0.00121*** (12.31)	0.00105*** (10.96)	-0.000485 (-0.300)
Trade	0.000584*** (6.792)	0.000438*** (5.970)	0.00103 (1.378)
Exchange Rate in Hundreds	-0.000135 (-0.839)	-0.000237* (-1.816)	-0.000699 (-0.481)
Inflation in Hundreds	-0.000276 (-0.730)	-0.000117 (-0.434)	-0.00138 (-0.0158)
Oil Production in Hundreds	0.00305*** (5.988)	0.00351*** (6.810)	0.00292 (1.096)
Year	0.00204*** (3.343)	0.00179*** (4.000)	0.0118*** (2.683)
Constant	20.30*** (16.68)	20.81*** (23.31)	0.578 (0.0655)
Observations	4,524	3,516	864
Adjusted R-squared	0.762	0.774	0.836
Time Trend & Year Dummies	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes
Years Included	1980-2016	<2008	>2008

*** p<0.01, ** p<0.05, * p<0.1

Results and Conclusion

- When total number of terrorism incidents increase by 100 (1 std. dev.), Foreign Direct Investment will decrease by 0.437% (\$ 21.8 million) on average;
- Terrorism incidents that target Businesses most significantly affect Foreign Direct Investment inflows; one additional business targeted incident results in a \$6.137 million loss in foreign direct investment on average
- Our results suggest it may be of interest for governments to invest in counter-terrorism measures as long as the costs do not exceed the losses incurred by the terrorist incidents
- Business targeted terrorism incidents have the most impact on Foreign Direct Investment inflows, and policies that provide more safety and security to businesses may improve FDI inflows

Acknowledgements

We would like to thank Dr. Cook and Dr. Hennessey for advising us throughout the duration of this research.



Data Sources

Variable	Source	Description	Time Period
Foreign Direct Investment	The World Bank	Foreign Direct Investment, net flows, in current dollars	1960 -2016
Total Terrorism	Global Terrorism Database	Each terrorism incidents; Terrorism attack types	1970 -2016
GDP per Capita	The World Bank	GDP per Capita	1960 -2016
GDP current US dollar	The World Bank	GDP in current US\$	1960 -2016
Population	The World Bank	All residents of legal statue or citizenship	1960 -2016
Exchange Rate	The World Bank	Exchange Rate, LCU per US\$, period average	1960 -2016
Inflation	The World Bank	the consumer price index (%)	1960 -2016
Openness to Trade	The World Bank	The sum of exports and imports as percentage of GDP	1960 -2016
Corporate Tax Rate	KPMG	Corporate Tax Rate	2003 - 2018
Oil Production	Energy Information Administration	Total Petroleum and liquid production, Thousand Barrels Per Day	1980 -2018
Control of Corruption	The World Bank	The perceptions of the extent to which public power is exercised for private gain, in units of a standard normal distribution.	1996,1998,2000,2002-2016
Political Stability	The World Bank	The likelihood of political instability and politically-motivated violence, including terrorism. In units of a standard normal distribution.	1996,1998,2000,2002-2016
Infrastructure	The World Bank	Access to electricity, % of population	1960 -2016

Second Robustness Check - Corporate Tax Rate

VARIABLES	(1) log(FDI)	(2) log(FDI)	(3) log(FDI)
Total Terrorism In Hundreds	-0.00437 (-2.041)	0.000722 (0.114)	0.000638 (0.101)
GDP Current Dollars in Billions	0.000129*** (35.63)	0.0000954*** (6.070)	0.0000954*** (6.071)
GDP per Capita in Millions	0.00515*** (14.87)	0.00432*** (3.397)	0.00433*** (3.422)
Population in Millions	0.00121*** (12.31)	0.00189** (2.349)	0.00189** (2.354)
Trade	0.000584*** (6.792)	0.000339 (0.706)	0.000343 (0.716)
Exchange Rate in Hundreds	-0.000135 (-0.839)	0.000927 (0.647)	0.000927 (0.647)
Inflation in Hundres	-0.000276 (-0.730)	0.0775 (0.892)	0.0770 (0.887)
Oil Production in Hundreds	0.00305*** (5.988)	0.00227 (1.178)	0.00228 (1.180)
Corporate Tax		-0.000213 (-0.141)	
Year	0.00204*** (3.343)	0.00551** (1.983)	0.00558** (2.036)
Constant	20.30*** (16.68)	13.23** (2.375)	13.10** (2.387)
Observations	4,524	1,131	1,131
R-squared	0.773	0.834	0.834
Adjusted R-squared	0.762	0.811	0.811
Time Trend & Year Dummies	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Third Robustness Check - Political Stability, Control of Corruption, and Infrastructure

VARIABLES	(1) Log(FDI)	(2) Log(FDI)	(3) Log(FDI)
TotalTerrorisminHundreds	-0.00437** (0.00214)	0.00127 (0.00375)	0.0000856 (0.00369)
GDPinBillions	0.000129*** (3.62e-06)	0.0000909 (8.69e-06)	0.0000904 (8.64e-06)
GDPperCapitaInThousands	0.00515*** (0.000347)	0.00419*** (0.000692)	0.00430*** (0.000661)
PopulationinMillions	0.00121*** (9.86e-05)	0.00186*** (0.000352)	0.00186*** (0.000349)
Trade	0.000584*** (8.60e-05)	0.000490*** (0.000150)	0.000477*** (0.000148)
ExchangeRatesInHudnreds	-0.000135 (0.000161)	-0.0000614 (0.000388)	-0.0000649 (0.000388)
InflationInHundreds	-0.000276 (0.000377)	0.00129 (0.00500)	0.000715 (0.00499)
OilProductionInHundreds	0.00305*** (0.000510)	0.00390*** (0.00114)	0.00414*** (0.00113)
PoliticalStability_n		0.0187* (0.0100)	
ControlofCorruptionEstimate_n		-0.00765 (0.0173)	
InfrastructureElectricity		-0.000468 (0.000768)	
Year	0.00204*** (0.000611)	0.00402*** (0.00127)	0.00372*** (0.00122)
Constant	20.30*** (1.217)	16.30*** (2.540)	16.87*** (2.446)
Observations	4,524	2,305	2,305
Adjusted R-squared	0.762	0.809	0.809
Time Trend & Year Dummies	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1