Terrorism and Economic Growth

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ABSTRACT

The objective of this research is to study the effect of terrorism on economic growth and the mechanisms of transmission of this effect. To do this, a model of simultaneous equations was applied to panel data for a sample of eleven countries (six developing and five developed) over the period 2008–2015. The findings of this study show the following: A positive effect of terrorism on economic growth for the whole sample as well as for the case of developing countries; a negative effect of economic growth on terrorism for the case of the total sample and the case of developing countries; and a negative effect of unemployment on terrorism for all the country samples. Furthermore, the study finds that people living in rural areas tend to engage more in terrorism that those of urban areas.

Keywords: Terrorism, Economic Growth, Simultaneous Equations
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1. INTRODUCTION

After Al-Qaeda's 2001 September 11 attacks on the World Trade Center, an icon of capitalism, terrorists want to do enough harm to a society. However, the damage can be in terms of loss of life and also in terms of economic losses. Both types of losses expose the government's inability to protect its citizens, which results in a loss of public trust and government legitimacy.

Admittedly, terrorist attacks are generally deadly, costly and persistent, which creates an atmosphere of fear and terror on the entire territory, disrupting society by rendering it at risk.

Terrorism can potentially affect economic growth in the short term through several channels. Such attacks can increase uncertainty, which would limit investment and divert foreign direct investment (FDI). For developing countries, FDI is a major source of savings for financing investments. Terrorism also holds back growth by raising the cost of higher wages, higher insurance premiums and increased security costs. These higher costs result in lower profits and, consequently, lower returns on investment.

The attacks on London's transportation system resulted in more than US$ 1 billion in damages. Similarly, terrorism can have an impact on key industries such as airlines, tourism and the export sector.

Similarly, conflicts, like terrorism, increase uncertainty, which decreases investment. In addition, internal conflicts represent almost double the share of gross domestic product (GDP) spent on defense, which limits spending on social capital and health.

2. LITERATURE REVIEW

Terrorism is defined as the premature use or threat of violence by individuals or groups of individuals in order to achieve a political or social purpose, by intimidating a wider public beyond that of the immediate victims.

Terrorists try to circumvent the democratic process by pushing concessions through the pressure of targeted citizens on their government to end the violence. Terrorists attempt to make their attacks seem random to maximize public anxiety because the risks would seem ubiquitous. In reality, the attacks are not random but are intended to exploit perceived weaknesses and perceived value.

Generally speaking, terrorist events are divided into two types: National terrorism and transnational terrorism. The first type

can have consequences only on the affected country and its institutions, citizens, goods and policies. Internal terrorism involves perpetrators, victims and targets only of the host country. By contrast, transnational terrorism targets more than one country. In this case, terrorists cross the border to commit their acts. However, terrorist incidents that start in one country and end in another country such as the case of air piracy or the shipment of letters booby traps. We now turn to three important determinants of per capita income (growth).

Concerning economic growth, firstly, it is clear that the initial level of per capita income has a positive effect on economic growth because of the notion of convergence. Accordingly, the income per capita of a poorer country exceeds that of a richer country[1]. Convergence depends on lower yields, in which countries are better able to add to output when there is less initial production and inputs.

Convergence implies that the countries to compare have identical production functions and transition equations, but differ according to their initial per capita income levels. This hypothesis can be considered for many Asian countries at similar stages of development that face similar production conditions.

Second, the share of investment in GDP is a key determinant of per capita income. Higher stock results in greater capital accumulation, which promotes capital growth and embedded technological change. A third influence on growth is trade openness, as measured by the ratio of the sum of exports and imports to GDP. Openness to trade can spur growth, as exports increase aggregate demand and larger imports provide raw materials and, for developing countries, technology transfer.

Sandler and Enders (2008) identified economic principles of terrorism. Developed economies are able to resist terrorism and experience a few macroeconomic consequences. This is usually because these economies are able to regain people's trust through increased security. Developed economies apply monetary and fiscal policies to curb the economic effects of major terrorist events, such as the riots of 11 September 2001. However, the majority of developing countries suffer significant macroeconomic effects as a result of terrorism. Terrorism and conflict increase uncertainty and lead to a loss of investors' confidence. As for the sectors exposed to the risks of terrorism, they suffer enormous losses when they are attacked.

Political violence also adversely affects economic growth by increasing public spending on security. In an article published by Blomberg, Hess and Orphanides (2004), the authors showed that each year of transnational terrorism reduces per capita income by 0.048%. For the Basque region of Spain, Abadie and Gardeazabal (2003) estimated a 10% decrease in per capita income over a 20 years period when electronic travel authorization started an active terrorist campaign.

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1   Barro (1991).

In an article published in, Bilgel and Can Karahasan (2016) sought to estimate the economic effects of the terrorism of the Kurdistan Workers' Party (PKK) in Turkey in a context of causality. They found that the average Turkish GDP per capita would have been 13.8% or an annual growth of 0.62% points higher if the country had not been exposed to PKK terrorism.

Examining whether economic growth has a dampening effect on terrorism, Seung-Whan (2015), using cross-national analysis of time series data from 127 countries, found that when countries benefit from high industrial growth, they are less exposed to terrorist events. These results show that economic growth cannot play a preventive role for terrorism, as it may be associated with other terrorist incidents in some cases. However, healthy economic conditions are very beneficial for fighting against terrorism.

3. METHODOLOGY

3.1. Data Description

According to the literature, we can observe an interdependence relationship between economic growth and terrorism. Indeed, economic growth can be influenced by terrorism and vice versa. In addition, each of these two is determined by a matrix of variables. Thus, we retain the following variables:

- Economic growth: Measured by the growth rate of real GDP per capita (dependent variable).
- Public expenditures: Approximated by government consumption relative to GDP (PE).
- Human capital: Rate of enrolment in secondary school (KH).
- Inflation: Measured by the consumer price index.
- Trade: Commercial openness.
- Investment: Measured by gross fixed capital formation in relation to GDP.
- Terrorism: Measured by the global terrorism index.
- Unemployment rate.
- The GINI index.
- FDI.
- Rural population (Rpop).
- Urban population.

In order to focus our study on the interdependence between economic growth and terrorism, we have opted for a model of two simultaneous equations that allow to take into account the reciprocal relationship between these two variables.

The two equations are specified as follows:

$$c\begin{cases} \text{Growth} = \beta_{1i,t}\text{PE}+\beta_{2i,t}\text{KH}+\beta_{3i,t}\text{Inflation} \\ +\beta_{4i,t}\text{opening}+\beta_{5i,t}\text{GFCF}+\beta_{6i,t}\text{GTI} \\ \text{GTI}=\beta_{1i,t}\text{Growth}+\beta_{2i,t}\text{KH}+\beta_{3i,t}\text{Rpop} \\ +\beta_{4i,t}\text{unemployment}+\beta_{5i,t}\text{GNI}+\beta_{6i,t}\text{URpop} \end{cases}$$

The descriptive statistics of the different variables used in the model are presented in the following Table 1.

Table 1: Descriptive statistics

Variables	Observations	Average	SD	Minimum	Maximum
GTI	96	4.536292	2.401155	0.01	9.314
Economic growth	96	2.809933	3.141653	−7.820885	10.63614
Inflation	96	5.262825	4.683167	−1.352837	20.28612
Opening	96	53.53206	21.52883	21.44693	115.3961
GFCF	96	23.03955	8.926509	8.329817	47.68586
PE	96	15.58593	6.279012	1.0000	24.094
KH	88	84.38487	23.53287	35.09796	131.2887
FDI	88	1.90328	1.474529	−0.2045323	8.814375
RPop	88	34.60843	17.19985	6.502	64.184
Unemployment	88	9.733716	5.605711	3.4	25.15
URPop	88	65.39157	17.19985	35.816	93.498
GINI	88	463696.1	1162269	5350.09	4294907

SD: Standard deviation, FDI: Foreign direct investment, GFCF: Gross fixed capital formation

The results of the autocorrelation matrix of the error terms show the presence of a weak correlation between the variables, which allows us to introduce them into the same equation (Table 2).

3.2. Results and Interpretations

The estimation results of the equations of our model are more or less acceptable. Below are the results of the estimates for the three country samples in our study, namely the whole sample, the developed countries and the developing countries.

1. Case of the whole sample

The estimates of our simultaneous equation system stipulate the following:

*   A negative effect of public spending on the economic growth of this country group. Human capital and inflation do not seem to have an effect on the economic growth of countries.
*   Trade openness and investment each have a positive effect on the economic growth of these countries.
*   Terrorism seems to have a positive effect on the economic growth of these countries. This result can be explained by the fact that terrorist attacks often trigger solidarity movements that take the form of influx of capital to the victim countries, as is the case of France in 2015, which positively influences economic growth. Hence the positive effect of solidarity of terrorism (Table 3).

As for terrorism, it seems to be negatively influenced by economic growth. This result is expected because improving the level of well-being induced by economic growth prevents young people from carrying violent extremist ideas, and thus being tools in terrorist acts. It is in a context of poverty, exclusion, inequality and marginalization that terrorism finds the right environment to develop and attract people.

In addition, terrorism does not spare one area to the detriment of the other. The population in both urban and rural areas are found to positively influence terrorism, although the coefficient of the rural area is the highest. This can be explained by the fact that the marginalization and deprivation of the fundamentals of the inhabitants of these areas can fuel violent terrorist ideas.

Unemployment has a negative effect on terrorism, which can be explained by the fact that terrorism is a multidimensional phenomenon, and from real experience showing young graduates

Table 2: Autocorrelation matrix

	GTI	Inflation	Opening	GFCF
GTI	1.000			
Inflation	0.4938	1.000		
Opening	−0.4275	−0.0701	1.000	
GFCF	−0.2870	−0.3616	0.2478	1.000

GFCF: Gross fixed capital formation

Table 3: Estimation results (the whole sample)

Variables	Coefficients	P
Growth		
PE	−0.2565511	0.004
KH	−0.0154168	0.259
Inflation	−0.0717542	0.221
Opening	0.0386273	0.001
GFCF	0.2114307	0.000
GTI	0.3967595	0.000
Terrorism		
Growth	−0.8654167	0.001
KH	−0.0170693	0.418
Rpop	0.1734722	0.000
Unemployment	−0.294633	0.000
GNI	−1.10$^{\text{E}}$-06	0.000
URpop	0.0801755	0.002

GFCF: Gross fixed capital formation

are relatively more targeted by terrorists. The latter are the most concerned by unemployment, hence the ambiguous effect of unemployment on terrorism. An effect that is far from direct since it is an output effect of a compensation of several contradictory effects.

Income inequality can be a source of economic growth because the investment needed to create wealth requires a certain inequality of income distribution which means that relatively large sums of money are held by some capitalists in order to invest. Hence the negative effect of inequality on terrorism through a positive effect on growth.

2. Case of developing countries

The estimates of our simultaneous equation system show:

*   The presence of a negative effect of public spending on the economic growth of developing countries. In addition, human capital, inflation and trade openness do not seem to have an effect on the economic growth of these countries (Table 4).

Table 4: Estimation results (developing countries)

Variables	Coefficients	P
Growth		
PE	−0.0858696	0.364
KH	−0.0163772	0.292
Inflation	0.0597406	0.352
Opening	0.017662	0.223
GFCF	0.1368903	0.003
GTI	0.3156048	0.004
Terrorism		
Growth	−1.892103	0.000
KH	−0.0296677	0.277
Rpop	0.2175408	0.000
Unemployment	−0.2654242	0.002
GINI	0.000119	0.000
URpop	0.0993976	0.018

GFCF: Gross fixed capital formation

Table 5: Estimation results (developed country)

Variables	Coefficients	P
Growth		
PE	−1.086392	0.000
KH	0.0023338	0.935
Inflation	−0.4081567	0.000
Opening	0.2359545	0.000
GFCF	0.5934458	0.000
GTI	0.0546811	0.829
Terrorism		
Growth	0.1347218	0.028
KH	−0.006355	0.597
Rpop	0.2428182	0.000
Unemployment	−0.142716	0.080
GINI	-3.57^{E}-07	0.032
URpop	0.0195424	0.293

GFCF: Gross fixed capital formation

As for terrorism, the results of the estimates consolidate the results obtained for the case of the whole sample.

3. Case of developed country
   Our model estimates show that, with the exception of terrorism and human capital, the coefficients for all other variables are significant and with the expected signs. Evidently, on one hand, terrorist attacks are much more common in developing countries than in developed countries. On the other hand, an institutional framework characterized by the presence of rights, democratic regimes, a low level of corruption, a certain socio-political stability, protected civil freedom and respected political rights is likely to neutralize the effect of terrorism in these countries (Table 5).

As for terrorism, in this group of countries it seems to be influenced positively by economic growth and the Rpop and negatively by inequalities and unemployment, which allows us to interpret this result in the same way as for the case of the whole sample.

However, when the variable to be explained is terrorism, the estimates of our simultaneous equation system show a positive effect of economic growth on terrorism. This can be explained by the fact that extractive economic growth that generates inequalities between individuals and between regions is likely to influence the tropism positively. Indeed, regional disparities and social inequalities can feed feelings of discontent among the poorest categories who may be attracted by extremists.

For economic growth to fulfill the functions assigned to it, to fight against poverty, marginalization and inequalities, to raise the standard of well-being of the whole population and to be the pillar of sustainable human development and fair, it has to be inclusive.

4. CONCLUSION

In the framework of this research, we are interested in studying a scourge that has plagued the world, namely terrorism. Thus, this research has focused on the following question: To what extent and through what mechanisms can terrorist attacks affect the economic growth of countries? To address this question, we chose a model of simultaneous equations applied to panel data for a sample of 11 countries (six developing and five developed). The findings can be summarized as follows:
- A positive effect of terrorism on economic growth in the case of the whole sample and the case of developing countries.
- A negative effect of economic growth on terrorism in the case of the whole sample and the case of developing countries.
- A negative effect of unemployment on terrorism for all the country samples.
- While both positive, the effect of belonging to rural areas on terrorism is larger than that of belonging to urban areas.

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