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The Economic Consequences of Terror: A Brief Survey

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Abstract: This brief survey reviews the economic consequences of terrorism. It is argued that the indirect effects of terrorism are likely to outweigh the direct effects. The former include changes in risk, transaction costs, demand, public finances and growth. We also address the nature of anti-terrorist policy and of policies reducing the negative impact of terrorism. The former can change the incentives for terrorists to break with social conventions or maximize the costs of conducting terrorism. The latter is particularly important as badly designed policies could enhance the negative economic effects of terrorist actions.

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1. Introduction

This paper briefly surveys some of the economic consequences of the new global terrorism. The attack on the United States of 9/11 focused attention on terror in a way that previous attacks both against the United States and against populations of other countries had not. An understanding of the nature of terrorism and the magnitudes of its effects is a prerequisite for designing successful policies to prevent terror, to alleviate the costs of terrorism, or to reduce an economy's vulnerability to attacks. The analysis of terror encompasses empirical studies and policy aspects of the fight against terrorism. Empirical studies to date have focused mainly on the short and medium-term effects of terrorism, that, in principle, are readily measured and quantified. Longer-run effects on the social equilibrium of the pluralistic western societies, that might be expected to be of lasting and greater importance but are difficult to quantify and measure, have also been addressed by the literature.

2. Data

The economic investigation of the consequences of terror requires data. Sandler and Enders (2004) provide an overview of data sources. Data that they present describes patterns of terror before the 9/11 attack and show that prior terror attacks took place in cycles. The importance of detailed data is also demonstrated in papers by Eldor and Melnick (2004) on Israel and by Brauer, Gómez-Sorzano and Sethuraman (2004) on Columbia. Eldor and Melnick use daily data to enable a close matching between terror attacks and financial-market responses. Brauer, Gómez-Sorzano and Sethuraman demonstrate the role of cyclical political variables and permanent non-political variables using a novel source of data on politically motivated and other types of murders.

3. Costs of Terror

The economic investigation of anti-terror policies requires an understanding of the consequences of terror. Various papers in the literature therefore analyze the costs of terror, the economic effects of terror on financial markets and international trade, and the post-terror fiscal and growth effects in developing and developed countries.

Estimates of the costs of terror confront problems of different types, including the definition of damage, the measurement of losses, aggregation issues, avoidance of double counting of damages in different sectors or statistics, and the causality of second round and indirect effects. Against the background of such measurement problems, the OECD estimated costs resulting from the terror attacks of 9/11 of 14 billion USD for the private sector, 1.5 billion USD for state and local government enterprises, 0.7 billion USD for the US federal government, and 11 billion USD for the rescue and clean-up operations, where the latter is shared between the private and the public sectors (Lenain et al., 2002).

The direct economic costs of terrorism are most pronounced in the aftermath of attacks. The intertemporal distribution of the indirect consequences depends on the nature of the attacks, the multiplier effects of the direct effects, and the type of policies adopted in response to the attacks. The US economy recovered quickly from the 9/11 attacks because the shocks were transitory and caused proportionately little damage to the American capital stock, left oil prices unaffected, and did not affect the economy's ability to generate income and wealth. This reflects a key difference between the economic legacies of terrorism and war, with ongoing civil war in particular damaging a country's capacity to grow (see for example Addison, 2003, and Stewart and FitzGerald, 2001).

While death, injury and capital destruction are the most visible effects of a terrorist attack, fear and the indirect effects of terror are harmful to the economy in the longer term. This is particularly true for the consequences of the attack of 9/11. Frey and Lüchinger argue that terrorists are intent on causing fear (2004). This is particularly effective in a centralized economy. Their paper raises the question whether a concerted anti-terrorist policy by a centralized government creates more fear than a less intense anti-terror policy would. The former case would yield the paradoxical result that anti-terror measures raise fear of terrorism further. Such scenario places governments in a dilemma where both responding and not responding to terrorism plays into the terrorists' hands.

It appears that consumer confidence in the United States had started to recover before 9/11 but then was held back by the psychological impact of the attack. In the medium term, the loss of confidence had an adverse self-reinforcing effect on growth in the

United States and Europe. The heightened uncertainty reduced spending, slowed down firm investment, led to layoffs and increased unemployment (Baily, 2001).

4. Financial Markets

The indirect costs of terrorist attacks vary in their distribution across activities, sectors, countries and time. Some activities and sectors are more vulnerable to attacks than others and consequently suffer a higher burden. Service sectors, for example, experienced a sharper drop in production if they were more closely related to firms affected by the twin tower attacks of 9/11 or by border closures, as inventories of service output cannot be accumulated in times of slack demand (Strauß, 2001). Highly networked and synchronized just-in-time industrial production can be expected to have been affected by supply disruptions due to 9/11.

Terror attacks can also change patterns of demand. Households, firms and governments may exhibit different preferences after exposure to terror or may re-assess their vulnerability to attacks. Reductions in demand have in particular been exhibited by transport and tourism sectors. With regard to tourism, Fleischer and Buccola find that foreign demand for accommodation in Israel is price elastic and sensitive to regional terrorism (2002). Local demand for accommodation, on the other hand, is price inelastic and does not react negatively to terrorism. Such effects through costs and changed demand are reflected in financial markets where assets values respond to changes in expected profitability.

Drakos finds, for example, that the already embattled airline industry was strongly and aversely affected by 9/11 (2004). Changed risk perceptions by consumers reduced demand for air travel and for complementary aircraft and hotel accommodation. Airlines also faced higher insurance premia when insurance companies reassessed the likelihood of large-scale terror attack using airplanes. Airline shares reflected these changes in lower stock market valuations. Airline shares exhibited higher systematic and individual risks post-9/11, with the systematic risk of selected US and European airlines shares more than doubling. This led fund managers to reduce their expose to these shares in their portfolios and hence put further pressure on the value of the airlines. The impact of the attacks may have varied by airline (Carter and Simkins, 2002) but the pressure on the sector as a whole increased significantly due to the attacks. A policy implication from this analysis is that state aid as a response to terror is not useful when terror induces significant and permanent changes in demand patterns.

Similarly, the insurance sector should not receive blanket subsidies in the wake of the attacks. However, public-private partnerships aimed at providing some degree of insurance for large-scale terror attacks have been instituted in several countries, for example the UK and Germany (Wolgast, 2002). These are effectively re-re-insurers that aim to encourage insurance firms to cover terror risks that otherwise would remain uninsurable within the private sector. From a policy perspective, the main challenge in designing such schemes is to avoid diminishing incentives for private agents to reduce their or their customers' exposure to terror risks.

Chen and Siems investigate the magnitudes of the effects of 9/11 on global and US share prices and compare the outcome to the consequences of other political, economic or natural shocks (2004). The magnitude of the effects of 9/11 on global and US financial markets was significant but not unique when placed in historical perspective. While some sectors were particularly strongly affected by 9/11, Chen and Siems show that the impact of the attacks on financial markets varied greatly across countries. Furthermore, the reactions of financial markets to 9/11 in the United States were less severe than the reactions to previous negative shocks. They conclude from this that financial markets have become more resilient in recent years and that regulatory authorities reacted wisely to the shocks by adding sufficient liquidity to the global financial system to prevent a banking crisis. Their analysis shows that consumers, firms, and governments that are not directly physically harmed by terrorists thus still lose from terror attacks. The question remains why market resilience varied so extensively internationally, given that globalization has integrated national financial markets, which should have resulted in more uniform responses to shocks.

Eldor and Melnick's empirical results indicate that the stock and foreign exchange markets in Israel functioned efficiently in the face of Palestinian terror (2004). Whereas the effects of the attack of 9/11 on financial markets was a one-off event, the terror directed at the population of Israel was ongoing, with 639 terror attacks in the period 1990 to 2003. The empirical results indicate that the terror did not affect the foreign exchange market but that the stock market was affected, with stock prices internalizing expectations of reduced future profits. The stock market (and also the foreign exchange market) never became desensitized to terror attacks. Eldor and Melnick propose that the evidence regarding functioning of financial markets under continuous conditions of terror in Israel has broader implications for the western world because of Israel's well-developed financial markets.

5. International Trade

Increases in transaction costs are one of the main indirect effects of terror. Strictly speaking, it is not the attacks themselves but the policy response to the attacks that causes these increases. These policies can include measures to prevent and to detect terrorism. Given the nature of the attacks of 9/11, these measures are especially enacted on borders and include closer inspections of people, vehicles and goods as well as more restrictive immigration regulations. The estimates for the scale of the increase in these international transaction costs vary between 0.5% and 3% *ad valorem* (Walkenhorst and Dihel, 2002). In addition, domestic trade may also suffer from higher transaction costs if new regulations prove costly for business. However, the scale of such increases has not been estimated to date.

Nitsch and Schumacher study the empirical effects of terrorism and other forms of insecurity on international trade (2004). They demonstrate that conflict, broadly defined, has significant effects on bilateral trade flows. A doubling of terror incidents reduces bilateral trade by four percent. The study raises the question whether policies can counteract the negative effects of terrorism on transaction costs, for example through enhanced international technical cooperation between customs officials and police forces.

6. Domestic Fiscal and Growth Effects

Gupta, Clements, Bhattacharya and Chakravarti provide empirical evidence on the fiscal effects of terrorism in low- and middle-income countries (2004). Their focus is on the effects of terrorism on government spending and revenue, and thereby on growth. The empirical results confirm that terrorism has significant fiscal effects and both direct and indirect effects on growth in a range of countries. Gupta, Clements, Bhattacharya and Chakravarti make an important contribution in identifying and quantifying the fiscal transmission mechanism for terrorism. An important role for aid conditionality is also identified, to avoid situations where governments in poorer countries permit terrorism to exist in order to reap financial gains from the fight of terrorism.

Garfinkel proposes a model in which a terror threat has two effects on the domestic economy (2004). A lower sense of domestic security reduces the value of the gross domestic product, which in turn reduces the intensity of the fight for control of the state. On the other hand, if government policy succeeds in reducing the scale or the effects of terrorism, the value of capturing the state rises and the domestic struggle for power intensifies. In practice, both effects were observed sequentially in domestic US politics after 9/11. Politicians first rallied around the flag before eventually resuming and even intensifying the domestic political struggle.

Garfinkel's analysis raises some important questions. First, does the scale of the two effects differ according to the type of conflict and the type of democracy? One or the other of the effects dominating the other might explain why some democracies appear to be in a high-conflict equilibrium (as Colombia, described by Brauer, Gómez-Sorzano and Sethuraman), while other democracies enjoy a low level of conflict (such as Switzerland, perhaps for reasons described by Frey and Luechinger). Second, are terrorists aware of their impact on the domestic struggle for power and could this awareness be manipulated by policy makers to reduce the intensity of conflict? The second option would then open a strategic interaction between the domestic policy makers and the terrorists, affecting income in the domestic economy and hence the intensity of the domestic power struggle, and thus the probability of political survival of the domestic policy maker.

Blomberg, Hess and Weerapana study the relationship between growth cycles and terrorism or civil war (2004). They find that in richer democratic countries terrorism is more likely during economic downturns. The paper emphasizes the need for further work about the relationship between conflict and growth in poorer countries, the role of transnational terrorism versus domestic terrorism, and the joint determination of both conflict and growth by omitted variables such as weak governance.

7. Policy Implications

With hindsight, it appears that the immediate or shorter-run economic effects of the 9/11 attacks were contained by insightful policy making by the monetary authorities in the US and Europe and by the robustness of the world economy itself. It is thus ironic that an event that we interpret as an anti-globalization attack failed to induce an international worst-case economic scenario due to the stabilizing forces of globalization. Eldor and Melnick, in their study of the response of financial markets in Israel to Palestinian terror, also suggest that market liberalization enhanced the capability of the Israeli economy to cope with terror.

A critical policy issue is the defense against terror, which requires an awareness of the motivations and objectives of terrorists. Bernholz describes the link between terror and supreme-value ideological systems (2004). He observes that the attacks of 9/11 originated from supreme values that make terror a rational albeit inhumane activity. The supreme values provide the rationality through lexographic preferences that pre-ordain the objective sought as having priority over all objectives and provide personal rewards. Bernholz proposes selective immigration and control over education as ways of insulating western society from the harm that adherents to the supreme values seek to do or are obliged to do. His analysis emphasizes the difficult trade-offs that policy makers face in protecting western liberal societies from terror attacks and in identifying the opponents of these systems.

Mueller addresses the policy implications of 9/11 in asking whether global terrorism should lead to a re-evaluation of how to design constitutions, how to award citizenship, and how to protect property rights (2004). Like Bernholz, Mueller addresses the social dilemmas (or the trade-off between the costs and benefits of constitutional rights) that western liberal societies face in seeking to adhere to liberal values while at the same time protecting citizens, residents, and future citizens from terror. The policy fields affected by these dilemmas are broad, and include domestic civil rights, immigration and education policies, the regulation of religions, and the granting of citizenship. Mueller concludes that terror significantly influences the balance of rights defined in a constitution. Mueller's premise is that global terrorism seriously challenges the democratic constitutional state. Yet 9/11 might not represent a failure of the western system from within. That might have been more appropriate in the case of the left-wing terrorism of 1970s Europe.

Sandler and Enders emphasize that terrorists respond to changed incentives and that anti-terrorist policies may induce substitution effects (as also modeled by Bernholz), with terrorists moving from hard to soft targets or shifting their activities over time (2004). Anti-terrorist policy is therefore more successful if conducted across the entire spectrum of potential terrorist activities so as to reduce terrorists' substitution possibilities. Otherwise a domestic anti-terrorist policy directed at stopping terror against the national population would shift the focus of terrorist activities to other countries. Sandler and Enders point out that, for example, guarding American embassies more heavily abroad after the dual attacks on US embassies in Kenya and Tanzania in the 1990s reduced embassy bombings but led to an increase in shootings and abductions of embassy personnel away from the embassies themselves.

FitzGerald investigates the international financial transactions supporting global terrorism and how policy can detect and undermine terror-related financial flows (2004). He identifies obstacles to unilateral and multilateral policy initiatives in this field. In particular, current regulatory systems do not succeed in excluding suspected groups or individuals from undertaking transactions or the transactions are reported too late for effective intervention to take place. Rather than adapting anti-money-laundering institutions to the task of combating terrorist finance, FitzGerald suggests policies of disincentives for undertaking terrorist financial transactions and improving systems for channeling migrant remittances.

Frey and Luechinger address defense issues by emphasizing the importance of an economy's vulnerability to terror and the incentive structure of terrorists (2004). They point out that countries with decentralized political decision-making systems are less vulnerable to disruption by terror and are thereby less attractive as terror targets (although terrorists have not necessarily focused on attacking political decision makers but rather have attacked the general population). Frey and Luechinger note the attack on the canton legislature in Zug in Switzerland and an attack on the parliament of Armenia (where subsequently a peaceful demonstration changed the government). The Indian parliament in New Delhi has also been the target of attack by Islamic terrorists. An implication of the argument made by Frey and Lüchinger is, for example, that centralizing political decision-making in the European Union could attract terror attacks.

Jain and Mukand demonstrate in a theoretical model how terrorist attacks change expectations, including the expectations of terrorists themselves (2004). Terror leads to anti-terror policies that affect the nature of future terror. By making anti-terror policy less predictable, policy makers can increase the uncertainty facing the terrorists, which is beneficial for society. Jain and Mukand show the importance of policy makers responding to terror both verbally and through action, and that anti-terrorist policy can also contain policy elements beyond standard security or economic policies.

8. Conclusions and Further Research

This paper surveyed some of the recent patterns of terrorist activities, its economic effects and policy options for dealing with terrorism. It was argued that the indirect effects of terrorism are likely to outweigh the direct effects. The former include changes in risk, transaction costs, demand, public finances and growth. We also addressed the nature of anti-terrorist policy and of policies reducing the negative impact of terrorism. The former can change the incentives for terrorists to break with social conventions or maximize the costs of conducting terrorism. The latter is particularly important as badly designed policies could enhance the negative economic effects of terrorist actions.

Future economic research may wish to pursue a number of avenues. First, the analysis of the economic motivation and calculus of terrorists still appears largely unresolved. Is it greed, grievance, peer pressure or something else which drives terrorists to, in the extreme, suicide attacks? Perhaps surveys of opinions, micro-econometric evidence or laboratory experiments may yield new insights.

Second, the issue of endogeneity between, for instance, terrorism and conflict on the one hand and growth, poverty or political freedom on the other hand is still difficult to model analytically and to control empirically. Finding new instruments may be one way forward in this field of research.

Third, the issue of poverty and inequality of individuals or of societies as well as the rapidly changing demographics in many poor countries and the effects of these factors on the rise of terrorism is still not clear. It is likely that horizontal inequality, that is inequality across groups, is a strong determinants of terrorist activity. This may operate through personal motivation (selfishly or altruistically) or through the supply side. In either case, further research in this field may yield strong policy implications for development aid.

Fourth, the analysis of the effects of terrorism on developing countries, and especially on developing Muslim countries such as Iraq or Pakistan, appear to be under-researched in economics.

Finally, the use of new datasets of terrorist activities and of new micro-econometric datasets of firms and households will allow for a better understanding of how different types of terrorism impact at the micro-level. As with the economic analysis of conflict as a whole, the largest dividends to further research may lie in this field.

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