

Lecture 10: Economics of Terrorism

- Terrorism has increased in importance and visibility in recent years
- Clearly it has changed and analysis important to try to understand those changes
- With suicide bombings, 9/11; Madrid and London and other Islamic fundamentalist terrorist actions the world would seem to be a much less safe place
- Transnational and domestic datasets available
- Action categories used:
 - Bombings
 - Hostage taking
 - Assassinations
 - Threats/hoaxes
- Considerable variation within categories
- What might come as a surprise is that terrorist incidents have been declining

Terrorist incidents

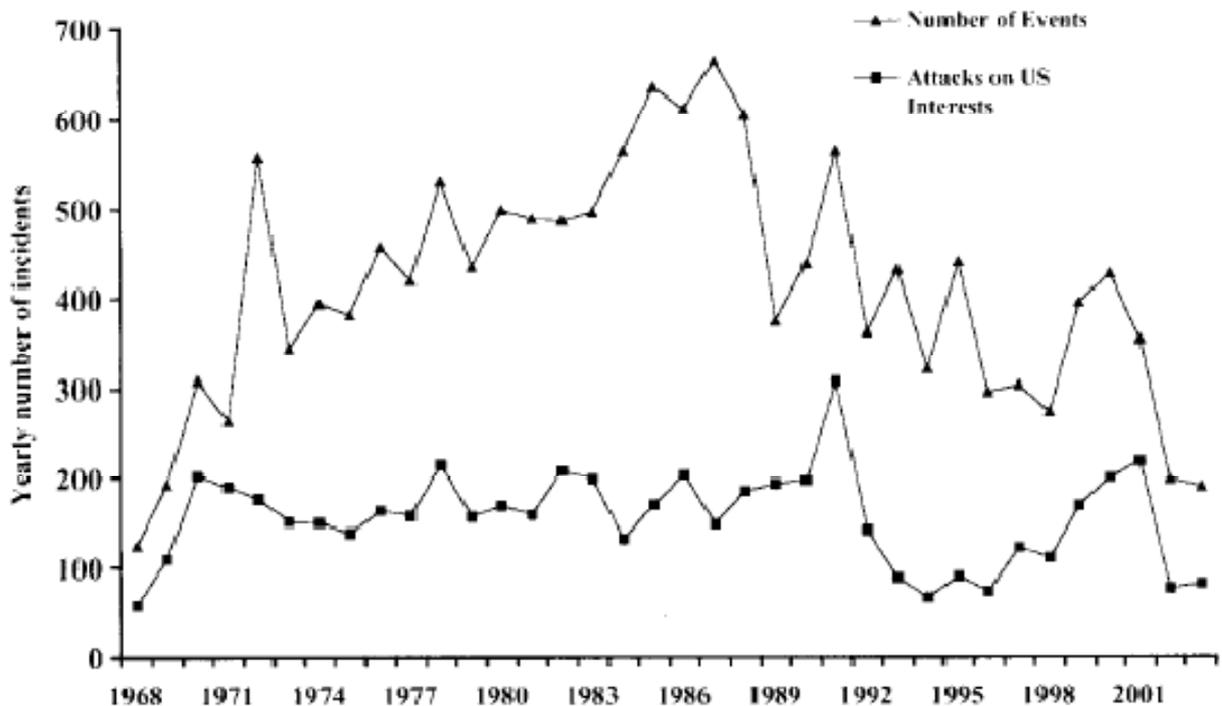


Figure 2.5. Transnational terrorist incidents: 1968–2003. *Source:* US Department of State (1988–2004) and Sandler and Enders (2004).

- Clear downward trend in incidents from mid 80s

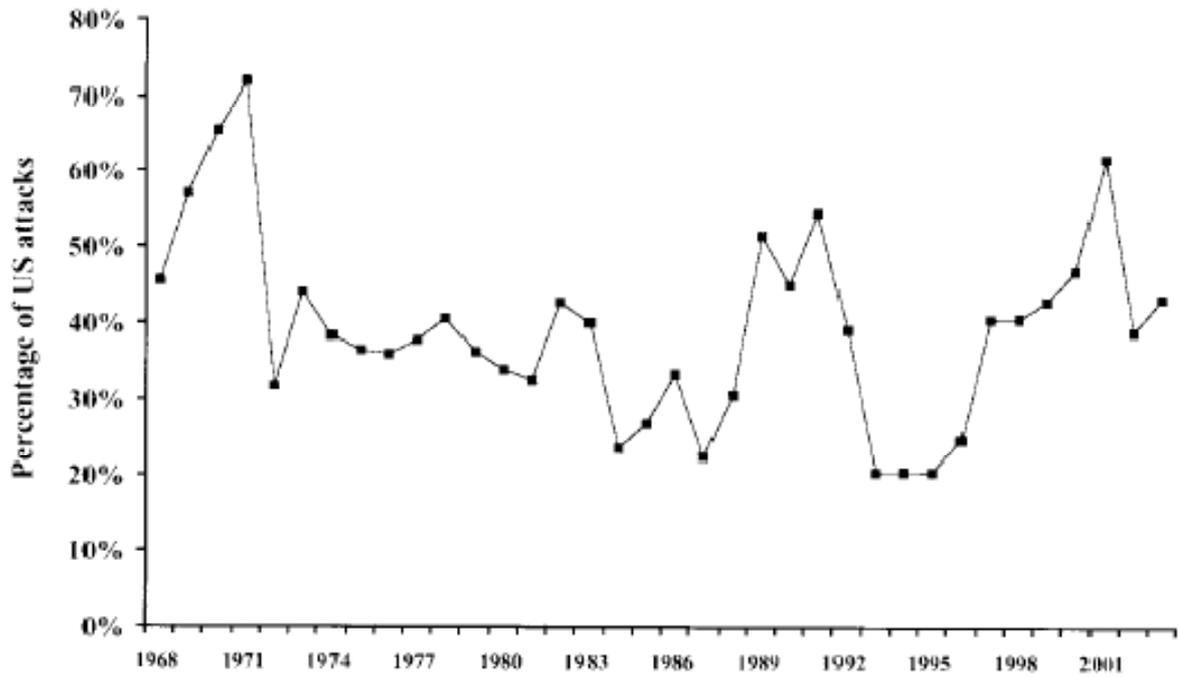
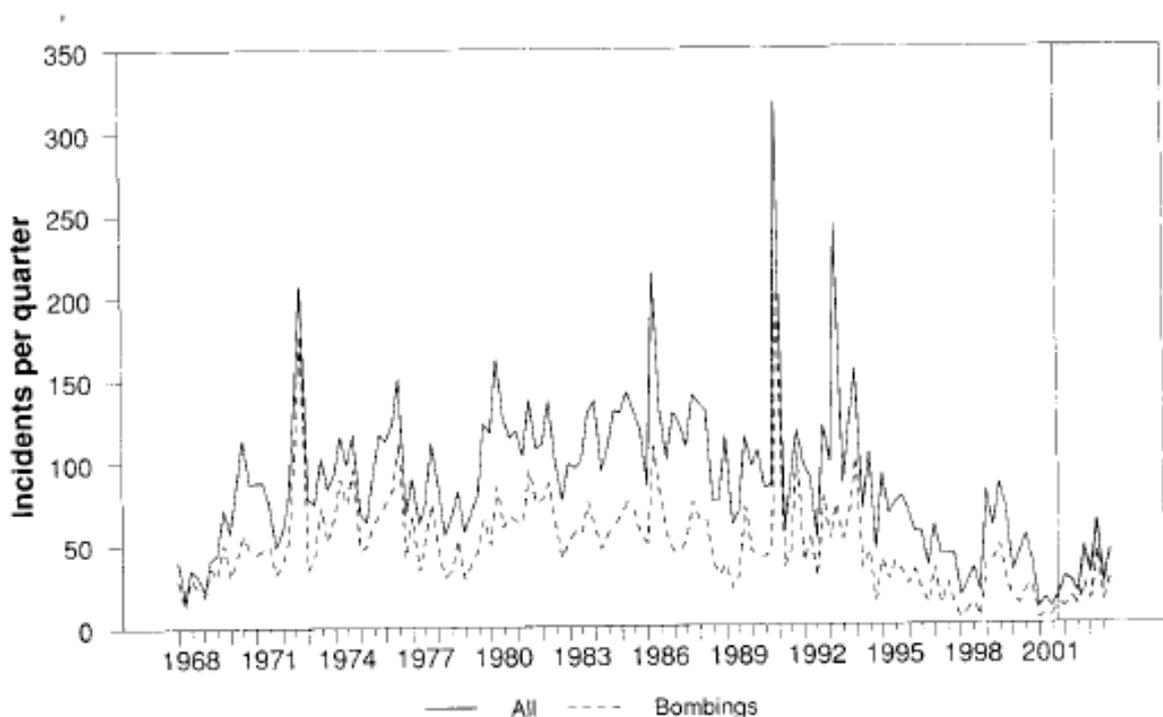


Figure 2.6. Proportion of US transnational terrorist incidents: 1968–2003. *Source:* US Department of State (1988–2004) and Sandler and Enders (2004).

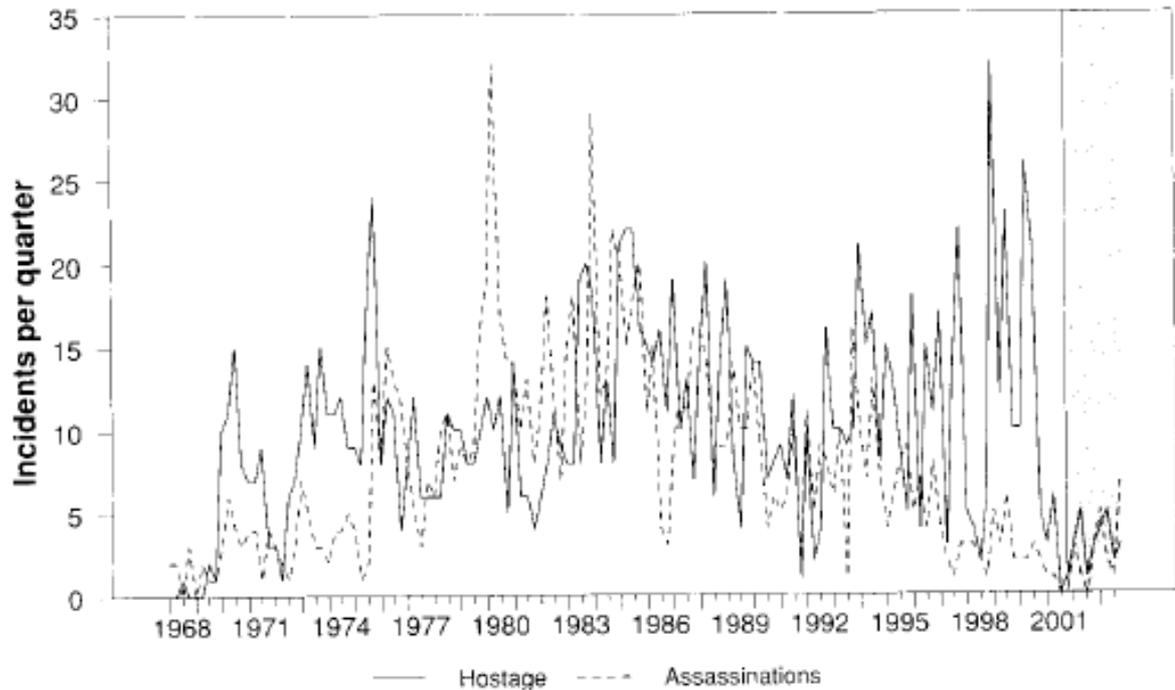
- 9/11 represented a post 1972 peak for US transnational incidents
- Upward trend since early 90s
- U shaped?

Bombing and other incidents:

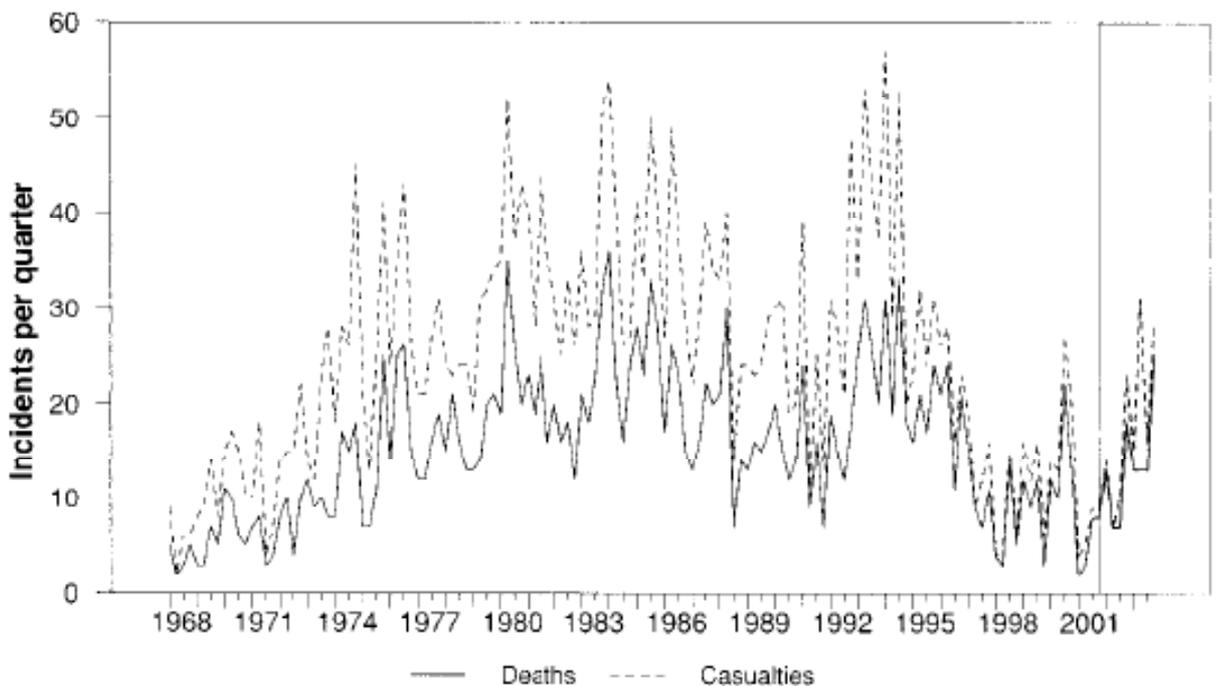


- Bombings tend to drive the total incidence figures
- Cycles
- Related to international incidents
- But again clearly recent years is not high

Hostages and Assassinations



- Hostages went high in 90s
- No clear 2001 effect



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- Recent deaths and casualties not particularly high historically, but as next figure shows lethality has increased

Lethality

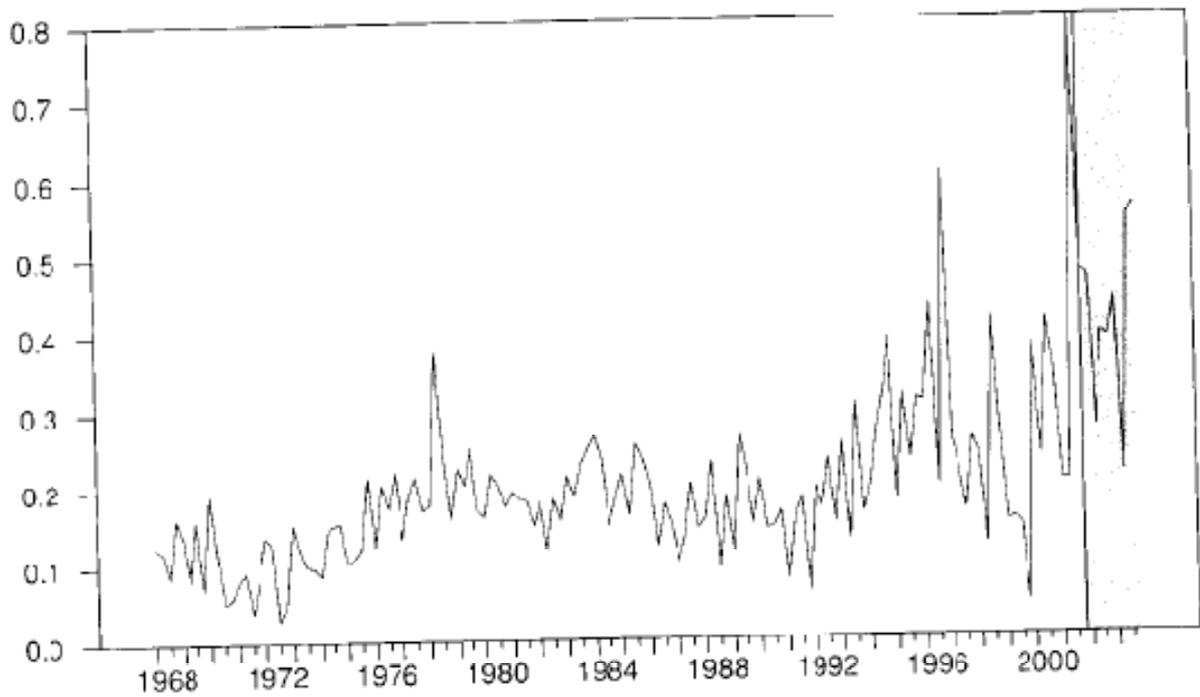


Figure 3.6. The proportion of lethal incidents.

- Terrorist incidents less likely
- but if involved in an incident more likely to die

Geographical distribution of casualty incidents

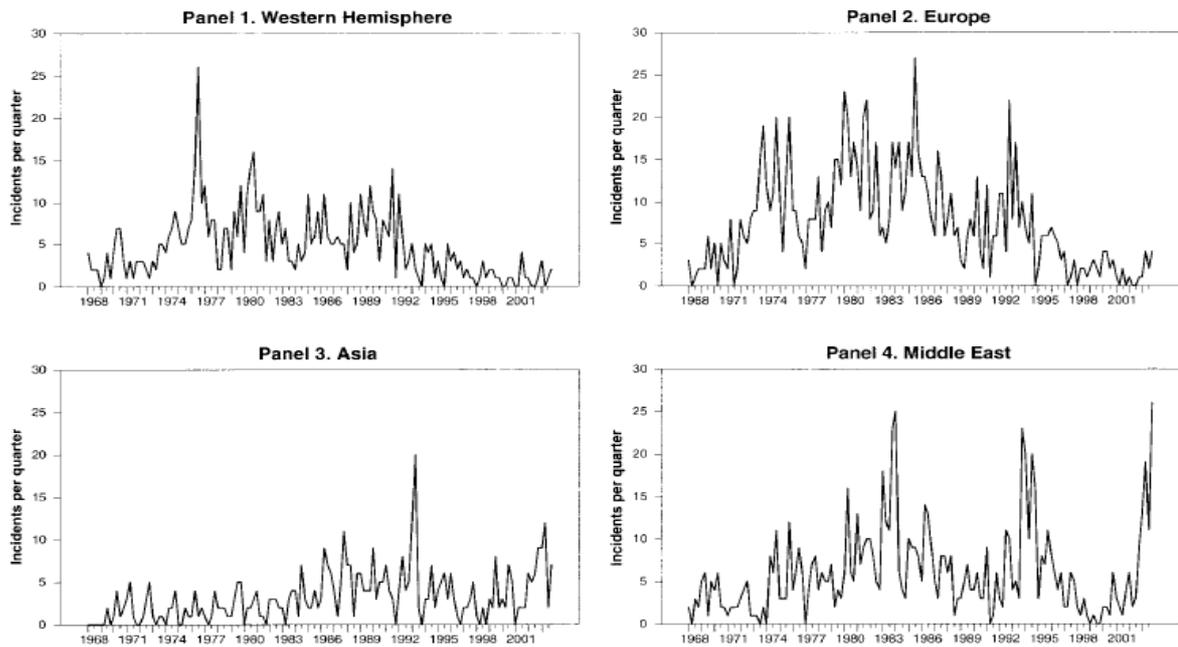


Figure 8.2. Casualty incidents by region.

West has seen a marked reduction, particularly Europe

Asia has experienced recent spike

Middle East has seen massive increase!

Data Problems

- Most rely on newspaper accounts –not complete or necessarily fully consistent coverage
- Don't contain much info on govt strategies/behavior during incident only terrorist
- Different definitions
- Not all data is public –secrecy and misinformation
- Will inevitably be many missing values
- Over time may be useful but cross country could be problems

Empirical analysis: has found

- Number of attacks highly volatile over time and geographically
- Increased incidence during economic downturns and elections
- Peaks correspond to international events eg 1972 Israeli war and 1991 Gulf War
- Over time have become more lethal
 - Change in motivation ideological to religious
 - Increase suicide bombers
- Markedly transnational since 1967 Israeli war
- Targets are frequently rich countries but not clear democracies suffer disproportionately

Time series analysis

- Has identified trends and cycles in the series and structural breaks
- Provides support for analyses of terrorists as rational agents
 - Has been used to identify substitution effects...
 - Hostage taking occurs less frequently than bombing –more complex and risky; so engage in high risk high payoff less often

Theoretical analysis

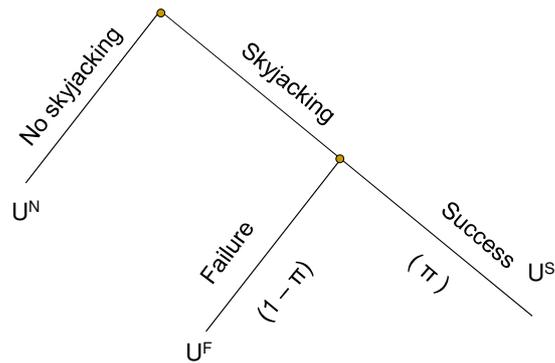
- Economists have developed analysis assuming that terror organizations and their members are rational.
 - Given their beliefs (“preferences”) terrorists choose action subject to constraints
 - For example, consider the choice of whether or not to undertake a “skyjacking” action
- terrorists can decide to undertake a terror action (T), or can decide to undertake a nonterror action (NT) or both –trade off
- $EU^{\text{sky}} = \pi U^{\text{S}} + (1 - \pi) U^{\text{F}}$,
- EU^{sky} =expected utility; U^{S} = utility if successful; U^{F} = utility if failure; π is probability of success
- If U^{N} = utility of no skyjacking then if

$$U^{\text{N}} < EU^{\text{SKY}} = \pi U^{\text{S}} + (1 - \pi) U^{\text{F}}$$

an attack will occur (and vice versa).

Policy options

- Increase U^N or reduce EU^{sky}
- Reduce U^S or increase U^F or reduce π



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Can consider using consumer theory: indifference curves; budget constraints

- Income, price and substitution effects

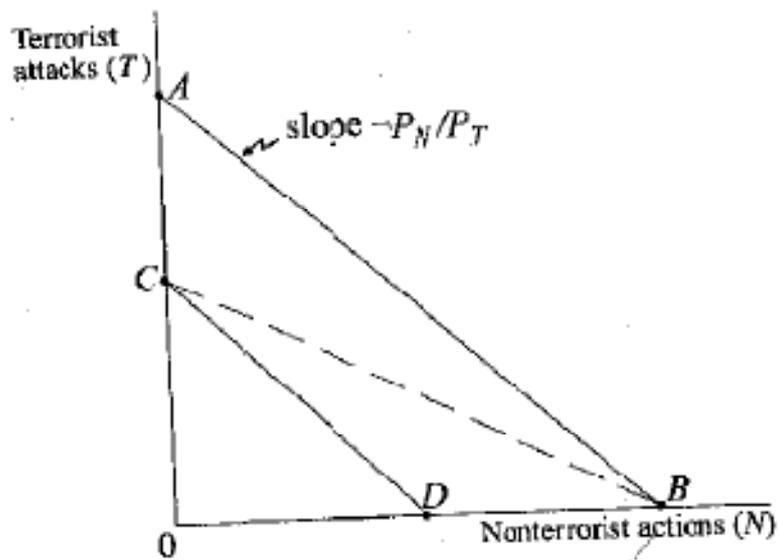


Figure 4.1. Terrorists' resource constraints.

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- Resource constraint (budget line) $P_T T + P_N N = I$ (line AB) Solve for T to get $T = (I/P_T) - (P_N/P_T)N$
 - If P_T is increased, the resource line pivots to CB -relative prices matter
 - If the resource base (I) is reduced, AB shifts down to CD -total resources matter
- Proactive policy: reduce I and/or raise P_T by retaliatory raids, preemptive attack, infiltration, seizure of financial assets, etc.
- Unusual insight : If P_N is increased, the resource line pivots to AD. P_N can be inadvertently increased by suppressing legitimate protests making terrorist actions cheaper!

Empirical work:

- Terrorism results from tensions: over resources and modernization
- Fundamentalism on rise –changing nature of activity
- Substitute for political conflict over resources
- Can be part of signaling and /or foreign policy tool/ asymmetric conflict
- Terrorists do seem to respond in relatively rational ways substitute means/targets/time
 - Enders and Sandler on introduction of metal detectors at airports
- Need portfolio of anti terrorist measure including political
 - Deterrence main policy in use but may not be best and may lead to escalation
 - Economic sanction probably not effective
 - Credible non negotiation policy important but is always high risk of default
 - Important to restrict terrorist funding: link to greed/grievance debate.

Game theoretical models

- Game theory provides a useful way of understanding and analysis the interactions between governments in response to terrorists. Consider prisoners dilemma in ordinal form

		<i>B</i>	
		Confess	Does not confess
<i>A</i>	Confess	2, 2	4, 1
	Does not confess	1, 4	3, 3

b. Prisoners' Dilemma in ordinal form

Figure 4.2. Prisoners' Dilemma.

- Nash equilibrium: the collection of strategies (N=0, 1, 2, ...) from which they is no unilateral deviation. Dominant strategy -confess and Nash equilibrium is both confess (worst social outcome)
- Important game a s represents common strategic interaction between states responding to terrorists

Alternative models

Chicken game

		<i>B</i>	
		Straight	Swerve
<i>A</i>	Straight	1, 1	4, 2
	Swerve	2, 4	3, 3

a. Chicken game in ordinal form

- “Best” (=4): appear strong and drive straight ahead when the other swerves; Next best (=3): both swerve and “save face”; 2 = lose face, save life; 1 = crash, lose life
- There is no dominant strategy, but there are 2 Nash equilibria; (both are better than 1,1 but there is no dynamic to make players stop at 2,4 or 4,2) ...
- The problem is getting to the equilibrium ...
 - Intimidation; lack of credible information about the players’ commitment
 - Disaster is likely
- Noncooperative outcome (coordination failure)
- Explains why international responses fail

Assurance Game

		<i>B</i>	
		Does not retaliate	Retaliate
<i>A</i>	Does not retaliate	2, 2	3, 1
	Retaliate	1, 3	4, 4

b. Assurance game in ordinal form

- 2 countries to decide whether to retaliate against terror and joint action required
- In this case no dominant strategy but 2 Nash equilibria (2,2 | 4,4)
- Whereas “chicken” is a simultaneous move game, “assurance” is a sequential move game, thus, if A moves first (leads), B will follow and mimic A’s move
- Explains importance of leader

Preemption game

		<i>EU</i>	
		Status quo	Preempt
<i>US</i>	Status quo	0, 0	4, -2
	Preempt	-2, 4	2, 2

Figure 4.4. Two-target preemption game.

- Assume individual action produces a public benefit = 4 at a private cost = 6
- resulting payoff matrix a “prisoner’s dilemma” game
- Mutual inaction results

	<i>Number of preempting nations other than nation i</i>					
	0	1	2	3	4	5
Nation <i>i</i> does not preempt	0	4	8	12	16	20
Nation <i>i</i> preempts	-2	2	6	10	14	18

Figure 4.5. Six-nation preemption game.

- *n*-player preemption game
- If *i* does not preempt but 2 others do, *i* gets a public benefit of $2 \times 4 = 8$ at cost=0
- If *i* does preempt, its net benefits fall by 2 (benefit=4 - cost=6=-2)
- Dominant strategy: top row > bottom row => no preemption => free-riding
- Explains why get free riding
- NB For domestic terror, no free-riding option and the net gain > 0 => preemption

For transnational terror we may have an “asymmetric preemption game”

		<i>EU</i>	
		Status quo	Preempt
<i>US</i>	Status quo	0, 0	4, -2
	Preempt	2, 4	6, 2

Figure 4.6. Asymmetric preemption game.

- In this case assume
 - EU cost=6; public benefit=4
 - US cost=6 but private benefit=8 and public benefit=4
- So Dominant strategy: US preempts; EU free-rides

Impact of terrorism:

- No obvious significant impact of 9/11 on US

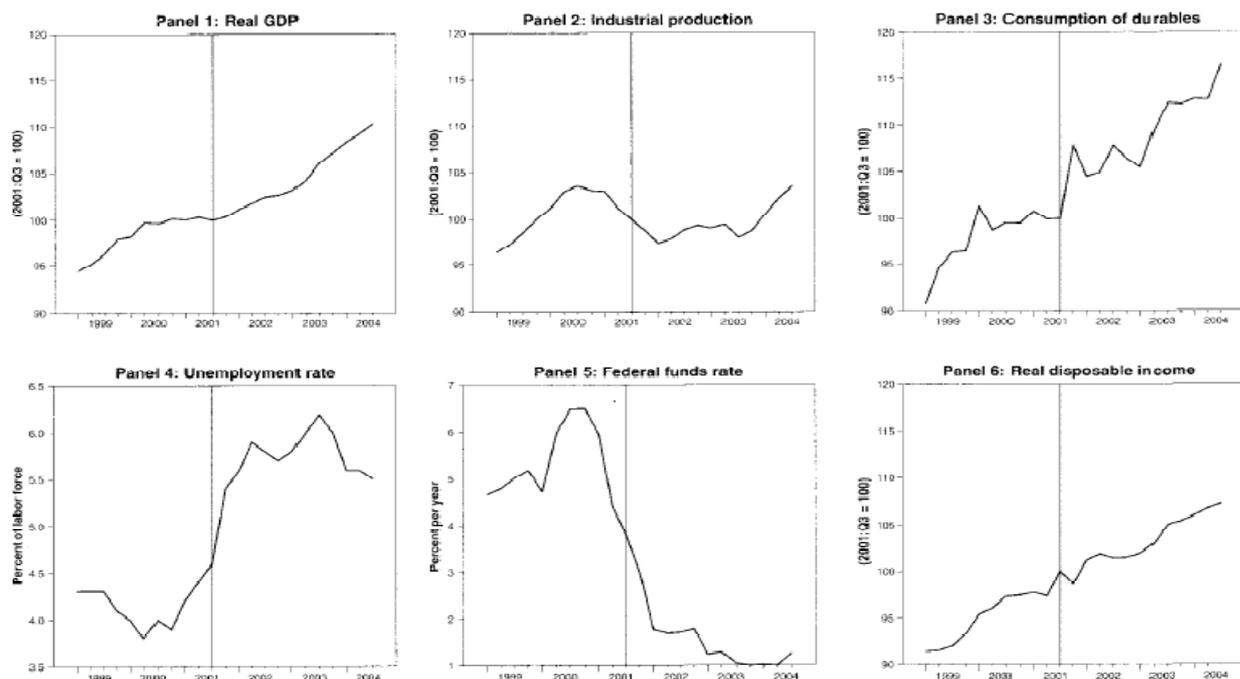


Figure 9.1. Macroeconomic variables and 9/11.

- Evidence of some costs to output, but tends to be low and short term
- Smaller than effects of other conflict
- Can have high persistent effects in particular regions and can have considerable effect—eg Basque study
- Can have important effects on some sectors—airlines and terrorism. Though evidence can be short run effects—can still be important costs
- If targeted bigger impact on poor countries
- Short term effects on stock markets
- Can impact on government policy—especially if leads to big increase in security spending, but overall economic effect likely to be small

Conclusions

- Despite media impression terrorism has been in decline
- But what there is has become more deadly
- Clearly important political determinants
- As with greed–grievance debate economics is important
 - Terrorist groups do seem to act as would expect
 - Respond to relative prices and resources –substitute
- The problem of international coordination is also readily understood through strategic game theory
- Hopefully can develop policies to coordinate behaviour
- Again as with greed-grievance economics can be important but not at cost of dealing with political and social issues