Impact of Political Violence on Work Done by Actuaries

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What do Actuaries Do wrt Insurance ?

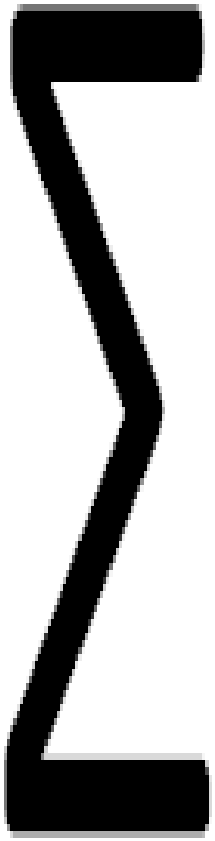
- Although actuaries are these days venturing into many different areas, their core work relates to:
  - Designing and pricing financial products including insurance products
  - Determining reserves to be set aside to meet liabilities under insurance policies
    - Past events (specifically reserves for incurred but not reported claims)
    - Future events
  - Advising on a number of other issues relating to risk management of insurance companies, including
    - Risk retention levels
    - Sales force compensation
    - Investment strategy

Presentation Approach

- This presentation seeks to illustrate, using one of the activities which actuaries are involved in (reserving),
  - the approach used by actuaries; and
  - how this has been impacted by “terrorism”
- The presentation then sets out how actuaries world-wide are looking at the new challenges posed by terrorism; and
- Finally makes some suggestions as to where Pakistan’s insurance industry should go to address the need posed by these risks

General Approach to Reserving

Reserve =



Expected Value of Outflows
(Benefit Payout / Reinsurance)

+

Margin for Variance

−

Value of Future Inflows

(Discounted for Time Value of Money)

General Approach to Reserving (contd)

Expected Value of Outflow in a Period

(Benefit Payout) =

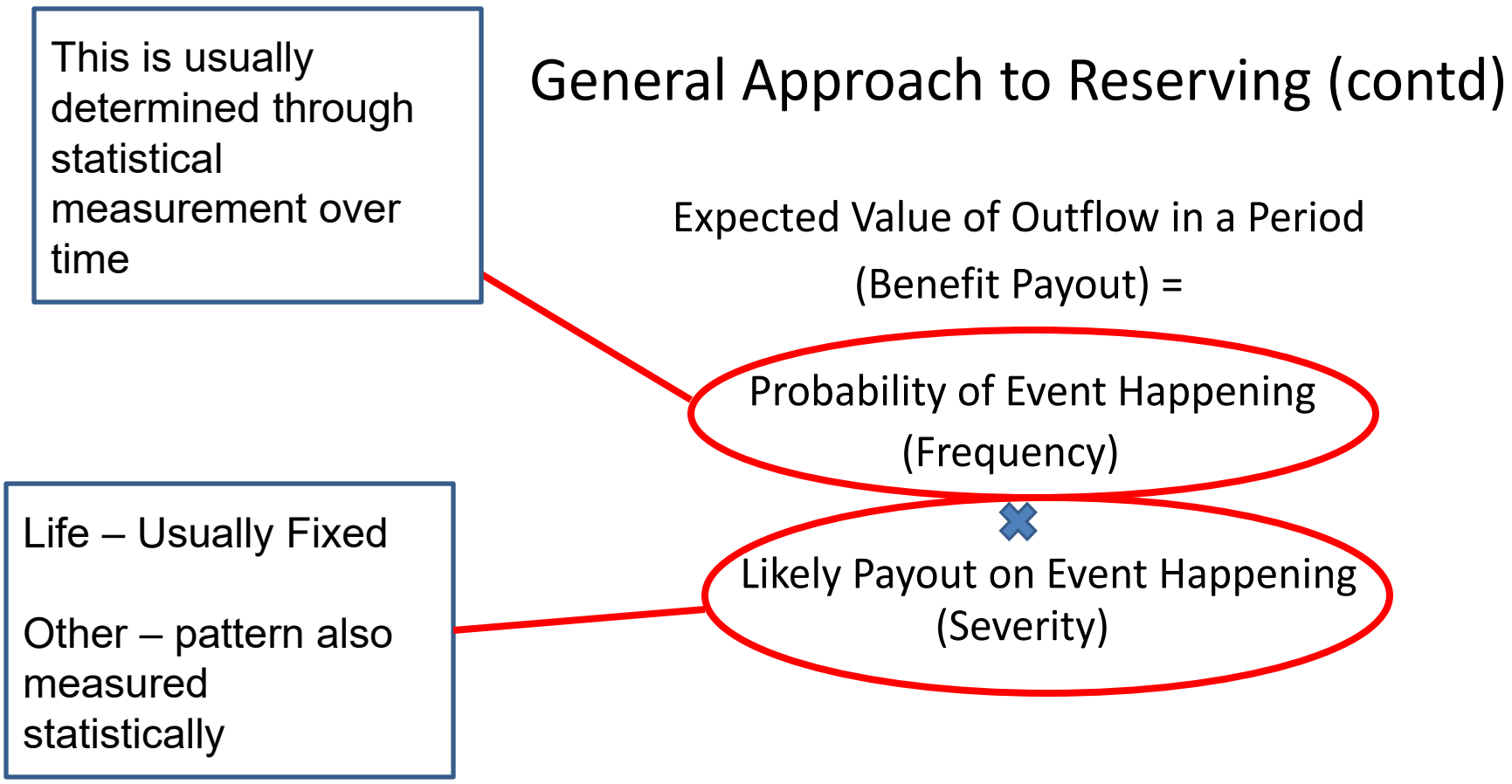
Probability of Event Happening

(Frequency)

Likely Payout on Event Happening

(Severity)

Normal Event Parameters



Actuarial Estimation

- For most risks the probability and severity of claims can be estimated by actuaries with a reasonable degree of certainty
- Even “catastrophic” risks have been modeled for many years based on
  - studies of events over many years
  - consideration of factors which may impact the risk (eg., for earthquakes – seismic zones)
- We need, therefore, to understand how modeling of risks emanating from political violence is different from risks emanating from floods, hurricanes, earthquakes, etc
  - Eg., how would losses from a hurricane (Katrina) hitting New Orleans be different from losses from a terrorist act (9/11) ?

How is Political Violence Different to Other Catastrophes ?

- The results of most incidents of political violence from an insurer perspective is similar to the result of a natural catastrophe
- We therefore need to understand what the difference is, given that theoretically the approach could be similar.
- First of all we need to define political violence. This could include:
  - Terrorism – an act of violence by a group of individuals acting from religious or political or other ideological reasons – eg., Marriott bombing
  - Public unrest – eg., riots following Benazir's murder in December, 2007 in Pakistan
  - Military Acts by Governments – on third countries or on their own people motivated by religious, political or other ideological reasons – eg., bombing of Al Shifa pharmaceutical factory in Sudan by US government in 1998
- This presentation will, however, focus on risks relating to terrorism

Terrorism vs Natural Disasters

- The American Academy of Actuaries' Terrorism Risk Insurance sub-group reported (in 2006) the following major differences
  - The potential of losses occurring which are much larger than those caused by natural disasters
    - "The primary insurance cost issue affecting the availability and affordability of terrorism risk insurance coverage is the potential that a single terrorist attack using weapons of mass destruction could cause a huge aggregate loss from a massive number of individual insurance claims."
    - Note – although horrific – the September 11, 2001 attacks did not cause as much damage as actuaries estimate can be caused by a terrorist attack
  - Difficulty in estimating the probability (frequency)

Modeling Terrorism Risk

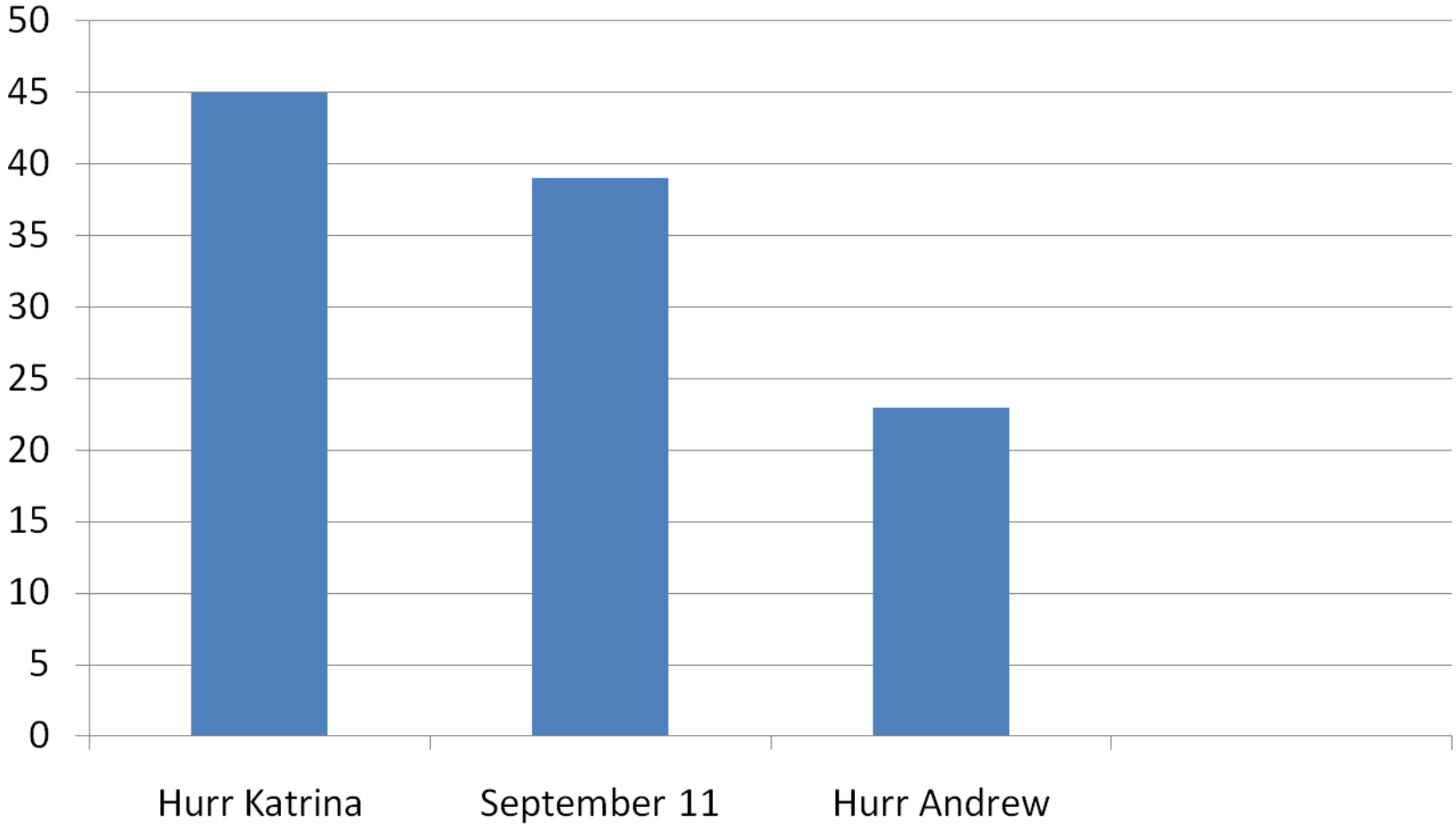
- The basic model for estimating losses from terrorist events can be stated as

$$EL = \Sigma_i V_i \cdot p(V_i, A_i, D_i)$$

  - Where
    - EL = expected loss
    - V_i = value of loss from target i
    - A_i = resources allocated by attacker to target i
    - D_i = resources allocated by defender to target I
    - p = probability of target i being totally destroyed
  - We need to examine each of the two main factors
    - The estimation of losses arising from events
    - The estimation of probability of events

Estimating Losses from Terrorist Attacks

Large Disaster Related Payouts (Values converted to US$ 2009 values – US$ bn)



Potential Size of Total Losses

- The difficulty in estimating the potential loss from a possible terrorist attack is enormous
  - We need to put the potential size of losses into an insurance financial context.
  - The AAA estimated the following after working through various scenarios (CNBR – Chemical, Nuclear, Biological, Radiological)

	Estimated Total Losses - US$ Billion			
	New York	Washington DC	San Fransisco	Des Moines
Large CNBR	778	197	171	42
Small CNBR	447	106	92	27
Truck Bomb	12	6	9	3

- The total capital of all insurers in the world would struggle to cope, therefore, with the worst case scenarios.
- The variability of total losses under various scenarios does, also , cause significant difficulties in pricing / reserving

Estimating Losses Under Various Scenarios

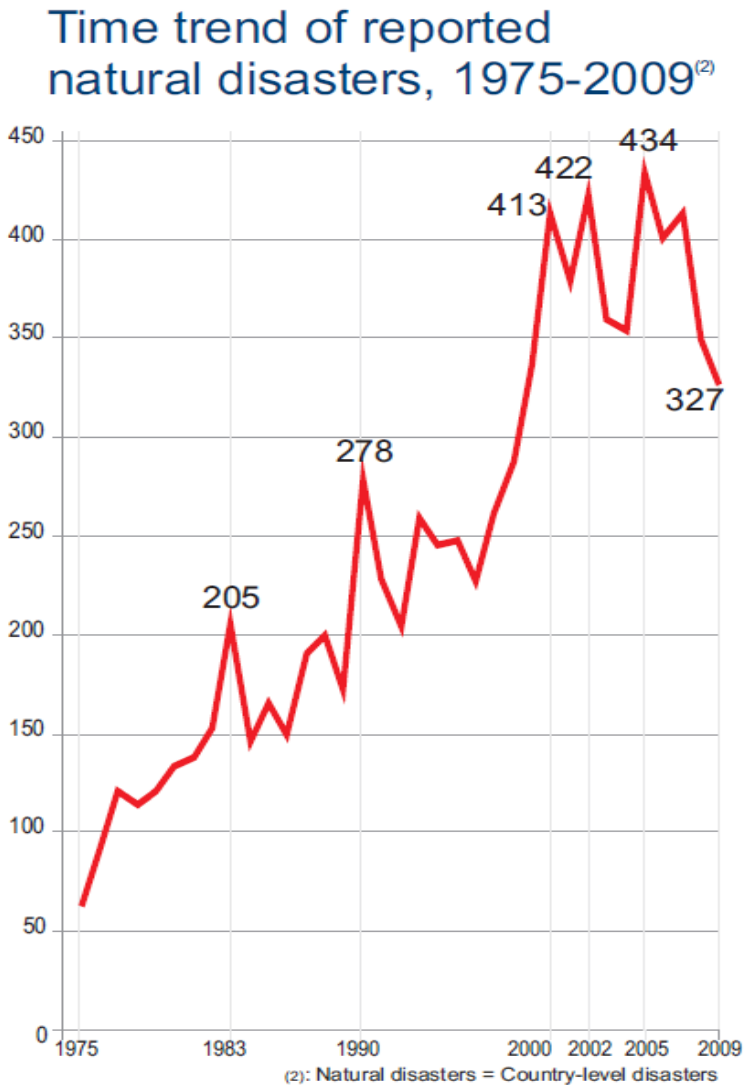
- Losses under various scenarios involves:
  - Development of event scenarios (type of weapon and target)
  - Determination of various types of losses
    - Model deaths, injuries and losses
  - Determine total losses
- Example – US$ 778bn estimated insured losses resulting from a Chemical attack on New York comprises of

Total	**778.1**
Auto	1.0
Commercial Property	158.3
Residential Property	38.7
Workers' Compensation	483.7
General Liability	14.4
Group Life	82.0

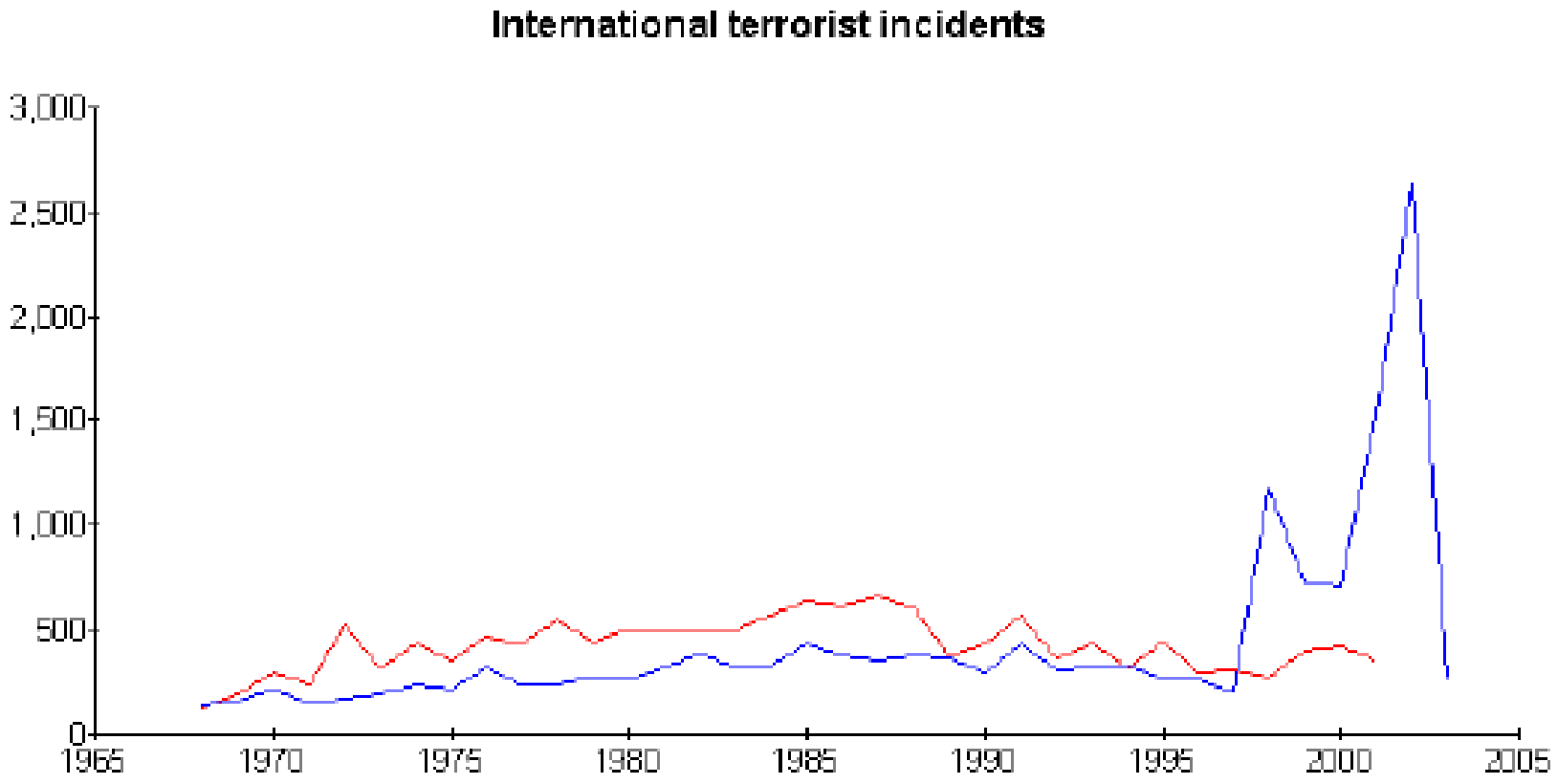
Estimating Frequencies

Frequency

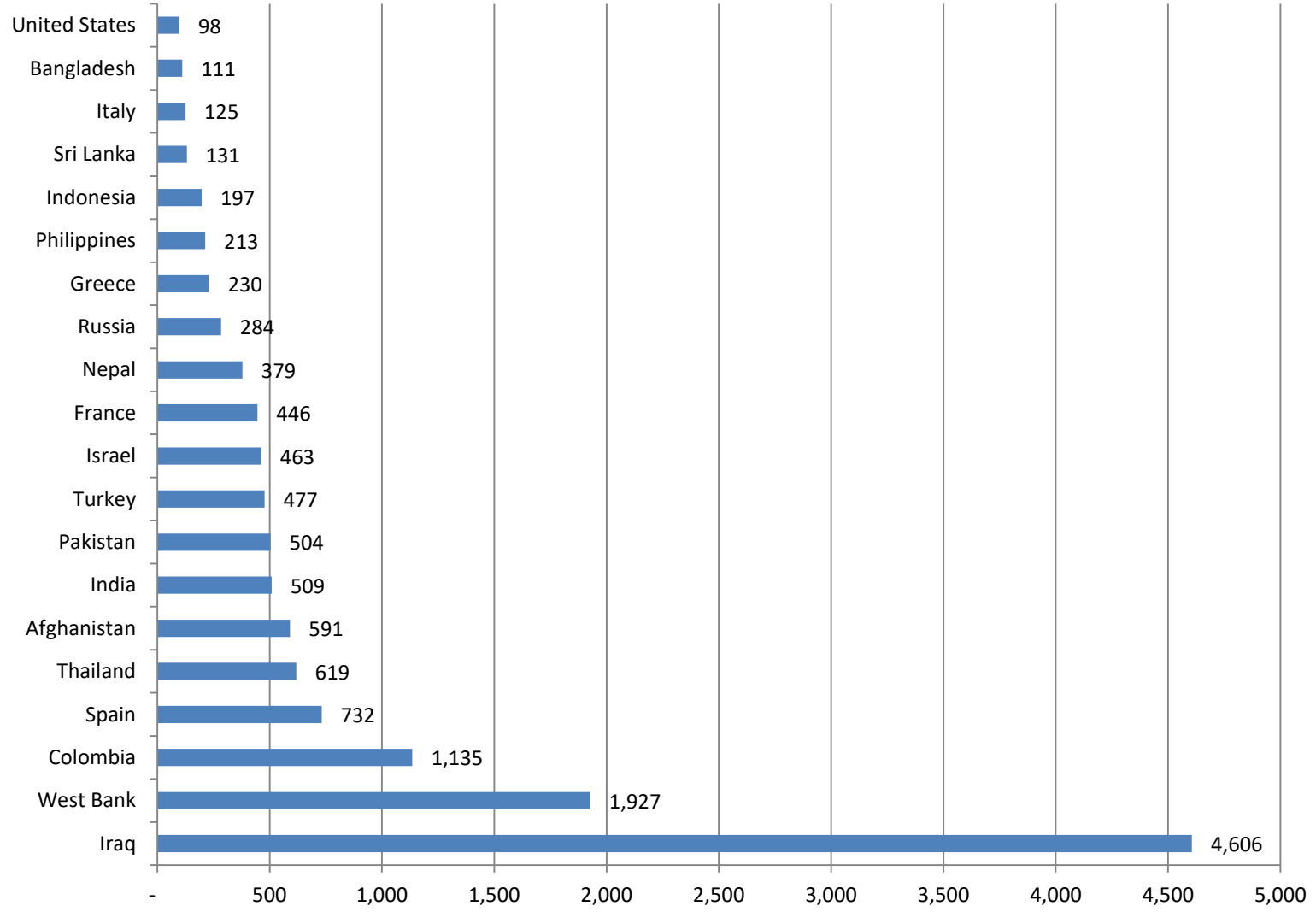
- The frequency of catastrophic events is even more difficult to analyse than simpler risks
  - Even natural disasters are not quite as frequent as other insurable events
  - The figure on the right shows how variable events have been over the past 34 years



“International” Terrorist Incidents



Number of Terrorist Attacks (2000 – 2006)



Rationale Approach

Approach to Assessing Probability

- The traditional actuarial approach to determining probability is essentially statistical
- The approach to determining probability of terrorist attacks can be statistical but needs also to be intuitive, to take into account:
  - the motivation behind attacks
  - high probability targets (five star hotels, security installations)
  - the strength of security against attacks
- Even after all of this the issue of not being able to estimate probability with any degree of certainty remains

Approach Providing Terrorism Cover

- There is a real need for covering terrorism risk
  - Excluding the risk or limiting it is not a suitable respond to a genuine need
- The rationale approach is what has been adopted by most countries
  - Pooling risks across the whole industry; and
  - Government support to ensure viability of the pool
- There have been initiatives in Pakistan towards this end but they have drifted and fizzled out
  - There is a need for the IAP to take this issue up seriously

Reserving for Losses from Catastrophic Events

- Interestingly while regulators would obviously welcome allocating capital for meeting catastrophic claims (especially for reinsurers), such allocations cannot be recognized as reserves or liabilities under International Financial Accounting Standards
  - IFRS 4 (para 14) provides that : ..”an insurer shall not recognise as a liability any provisions for possible future claims, if those claims arise under insurance contracts that are not in existence at the end of the reporting period (such as catastrophe provisions and equalisation provisions)”
- There is, therefore, a clear distinction between capital allocation and liability recognition as far as catastrophic losses are concerned
- This is an issue which seriously needs to be reconsidered by the IASB

Summary

Summary

- Although theoretically terrorism risks are much like other risks, difficulties arise from:
  - the variability, and potential gigantic value, of the value which is at risk; and
  - inability to accurately assess the probability of terrorist events arising
- Suggested approach
  - Provide cover through pooling protected by government support
  - Review the approach to reserving – allow accumulation of catastrophe reserves in accounts

Thank You