

**TOURISM AND TERRORISM: THE
NATIONAL AND INTERREGIONAL
ECONOMIC IMPACTS OF ATTACKS ON
MAJOR U.S. THEME PARKS**

By

Harry W. Richardson, Peter Gordon, James E. Moore II,
Soojung Kim, Jiyoung Park and Qisheng Pan

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INTRODUCTION

- USC economic impact modeling efforts use 2 models:
 - SCPM (Southern California Planning Model) for regional impacts. SCPM disaggregates an I-O model over 3,023 zones in the 5-county Los Angeles region, and also includes a highway network to endogenize traffic flows
 - NIEMO (National Interstate Economic Model) for interregional (interstate) impacts
- This paper uses only NIEMO
 - To analyze theme parks in several states
 - To avoid identifying individual parks; this would have been obvious in SCPM because direct impacts are highly localized

INTRODUCTION (cont.)

- We examine a conventional bomb attack on 11 individual theme parks plus 2 clusters (multiple theme parks in the same metropolitan area) in 8 states
- The attacks are alternatives not simultaneous
- We do not estimate the costs of deaths, injuries, and physical damage to tourist infrastructure (our guess is that these might total \$250 m.) The overall economic impacts are much higher

NIEMO

- Details of NIEMO were presented yesterday. Only the briefest outline is given here (primarily for new attendees)
- It builds on MRIO (Multiregional Input-Output) models first attempted in the 1970s and 1980s
- It combines State level I-O data (IMPLAN) with interregional trade flows (CFS), generating a 47 sector (USC sectors) x 52 regions (50 States, Washington, D.C. and RoW) matrix
- Unlike Jackson et al. (2004) which used a gravity model, NIEMO uses a new version of the Fratar model that estimates both on- and off-diagonal flows for each sector (18 service sectors are included in the on-diagonal flows while only the 29 commodity sectors are assumed to enter interstate trade via the off-diagonal flows)

DIRECT AND INDIRECT NOT INDUCED IMPACTS

- Results presented here do not include induced impacts
 - MRIO often ignores them because induced consumption rarely crosses interstate lines (Miller and Blair, 1985)
 - Although there are local induced impacts associated with local indirect impacts, inaccuracies result from indirect imports being allocated to same destination sectors as local supplies
 - In this application (theme parks), there may be additional consumption in origin states associated with negative direct effects in theme park states (induced in a specific but non-traditional sense)
 - The net result is that our impacts are underestimates

DIRECT EFFECTS

- In our case study, these include not only theme park expenditures, but also accommodation, food and transportation
- Our NIEMO calculations do not include air transportation because most airlines operate in many states. The maximum national loss could be \$11.85 billion over the assumed 18-month recovery period

TERRORISM AND TOURISM

- No US history (Eric Rudolph's Olympic attack at Atlanta in 1996 is the closest approximation)
- As stated earlier, we have in mind a conventional bomb, perhaps killing 20, injuring 200 and destroying enough attractions to require a few months repair (but only 1 month of total closure)
- We focus on the business interruption consequences
- Our baseline looks at gross impacts. We also examine a net impact scenario where tourist \$s are diverted elsewhere (national parks)

TERRORISM AND TOURISM: LIT REVIEW

- Drakos and Kutan (2003): “Zero Sum Game” where total tourist revenues remain the same, but market share of an attacked country drops. Recovery period: 4-7 months
- Enders and Sandler (1991): In Spain, each Basque incident deters 140,000 tourists; in 1988 there would have been 50% more tourists without terrorists
- Frey *et al.* (2004): Surveyed a range of studies with recovery periods as short as 2-3 months and as long as 18-21 months

LUXOR AND BALI

- Luxor (1997): 58 deaths
- Bali (2002): 202 deaths
- Taba (October 2004, 34 deaths) and Sharma el Sheikh (July 2005, 63 deaths) too recent
- Monthly visitor data available for Luxor and Bali
- Short-term: immediate precipitous decline followed by slow recovery over 6 months
- Long-term: pre-attack levels restored after 18 months
- Template for our theme parks study

BACKGROUND ASSUMPTIONS

- Recovery would be long and economic impact would be nationwide
 - Role of theme parks in American psyche
 - Focus on children; high share of theme park visitors
 - “Probability neglect.” Exaggeration of risk and discounting low probability of being a victim
 - “Displacement effect.” Why risk the theme parks with so many other tourist destinations available?

SPECIFIC ASSUMPTIONS

- Alternative, not simultaneous, attacks
- All theme parks in a metropolitan cluster respond in the same way regardless of which is attacked. A cluster and an individual theme park are equivalents
- An attacked park (or cluster) would close for 1 month, operate at 30% of capacity for next 6 months, then return to normalcy (linearly) through to the 18th month
- Other major theme parks operate at 50% of capacity for 6 months then return to normalcy by the 18th month
- No allowance for seasonal fluctuations

RESULTS (Table 1)

- Analysed attacks on 13 theme park complexes in 8 States
- 2 of these were clusters: all major theme parks in a Florida metropolitan cluster (Cluster A) and in a California metropolitan cluster (Cluster B)
- Total impacts in clusters: \$21.8 - \$23.1b.
- Total impacts in other theme parks: \$19.2-19.4b.
- Foreign indirect impacts: \$290-352m.
- Direct impacts: \$11.8-14.2b.
- Indirect impacts: \$7.4- 8.9b.

NO SPILLOVER EFFECTS

- More conservative case: No spillovers to other theme parks
- Differences in impacts dramatic (Table 2): ranging from c.\$500m. in each of the following States (Virginia, Pennsylvania and Illinois) to \$11.3b. in Cluster A (Florida)
- Important implication: in spillovers scenarios, attacking a smaller (presumably less protected) theme park pays off
- Without spillovers, attacking a theme park in a cluster is the most effective terrorist option

SPIILLOVERS vs. NO SPIILLOVERS

- The results are significantly different, especially for theme parks outside the clusters
- The no-spillover scenario is a limiting threshold case
- We examine only one of many possible spillovers scenarios, but a very plausible one. Public perception and behavioral adjustments are key
 - The spillover cases assume nationwide fear and avoidance of theme parks, regardless of the location of the attack
 - The recovery period assumptions are well grounded in international experience (although the U.S. response could be different, e.g. would American families react to a domestic theme park attack in the same way as Australian singles to a Bali bar attack?)

DIVERSION SCENARIO

- All losses not net: tourists would go elsewhere
- We examined one hypothetical case: day visitors (55%) stay home, and overnight visitors (45%) go to national parks
- To examine the maximum impact case, an attack on Cluster A results in reallocation of lost overnight visitors to national parks over 18 months in proportion to each national park's current share
- Other diversion scenarios (e.g. to beach resorts) would have very different geographical impacts

DIVERSION SCENARIO RESULTS (Table 3)

- National Net Loss: \$8.3b.
- Losers:
 - Florida: -\$10.6b.
 - California: -\$4.7b.
 - Ohio: -\$0.73b.
- Gainers (often sparsely populated, low-density States):
 - Arizona: +\$0.72b.
 - Utah: +\$0.63b.
 - New York: +\$0.57b
 - Massachusetts: +\$0.53b.
 - Wyoming: +\$0.42b.

DIGRESSION: TEST OF THE LOCATIONAL SENSITIVITY OF THE MODEL

- In NIEMO, does the location of the direct impact matter?
- To test this, we assumed a \$100m.decline (without spillovers) in theme-park-related revenues in each of the 8 states
- Results (Table 4) are consistent
 - >90% of impacts are intrastate
 - Interstate impacts subject to distance decay
 - Type I multipliers in 1.55-1.68 range

CONCLUSIONS

- Ours are “What If?” scenarios; until an attack happens, no one knows
- We examine 3 cases:
 - Gross losses with nationwide spillovers
 - Gross losses with no spillovers, only local impacts
 - Net losses (diversion). We consider one example (overnight theme park visitors substitute the lower density, presumably safer, national parks)

CONCLUSIONS (cont.)

- With spillovers, economic impact range from \$19b. to \$23b.
- Loss in airlines an additional \$12b.
- Compare with latest 9/11 estimate of \$32b.
- Without spillovers, economic impacts range from \$0.5b. to \$11.3b.
- In diversion (National Parks) scenario net loss is \$8.3b., with major losses in Florida and California offset by more widely dispersed gains, often in sparsely populated States such as Arizona, Utah and Wyoming

POLICY IMPLICATIONS

- Obvious: the economic impacts are very large, certainly sufficient to justify expensive and sophisticated prevention measures (probably stronger than those already in place)
- However, the most cost-effective strategy depends on the most probable scenario: in spillover scenarios even the smaller parks need a high level of protection. A small sleeper cell could cause massive economic impact damage, even at a relatively small park
- If there are no spillovers and symbolic targets are more attractive, it makes sense to focus prevention efforts on the clusters
- Because of the spatial extent of externalities, DHS subsidies to smaller parks may merit consideration in the spillovers case, as opposed to local or State subsidies to larger parks in the no-spillovers case