TOURISM CRISIS MANAGEMENT

US Response to September 11

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Abstract: Policymakers are faced with the predicament of if and how they should respond to an unexpected and sudden downturn in tourism demand. In the past, they have made these decisions in the absence of research into the relative effectiveness of different responses. The downturn in the United States following September 11 is a particularly vivid example of tourism crisis. This paper analyzes the effects of this crisis using a computable general equilibrium model of the US and also examines potential and actual policy responses to the crisis. Sector-specific targeted subsidies and tax reductions are found to be the most efficient means of handling the situation. Keywords: tourism crisis management, September 11, computable general equilibrium.

Résumé: La gestion de crise pour le tourisme : la réponse des Etats-Unis au 11 septembre. Les décideurs se trouvent devant la perspective difficile d’avoir à décider si et comment ils devraient réagir à une baisse inattendue et soudaine de la demande touristique. Dans le passé, ils ont pris ces décisions sans pouvoir se baser sur des recherches sur l’efficacité relative des différentes réponses. La baisse aux Etats-Unis après le 11 septembre est un exemple particulièrement saisissant d’une crise du tourisme. Cet article analyse les effets de cette crise en utilisant un modèle de l’équilibre général calculable des Etats-Unis, et il examine les réponses possibles et réelles à la crise. On conclut que les moyens les plus efficaces pour gérer ce genre de situation sont des subventions affectées à des secteurs spécifiques et des réductions d’impôts. Mots-clés: gestion de crise en tourisme, le onze septembre, équilibre général calculable.

INTRODUCTION

The contribution of tourism to both industrialized and developing countries is now so great that any downturns in the level of activity in the industry are a cause for concern. The repercussions extend beyond activities directly associated with tourism (notably, airlines, hotels, and catering), to those supplying intermediate or final goods purchased by firms and employees in the industry, so that all sectors of the economy are affected to a greater or lesser extent. The general response by the industry and related organizations to significant downturns in tourism...
demand is to lobby governments to implement a range of policies to offset the downturn. Policymakers are then faced with the difficult decision of what, if any, measures to take, particularly since the implementation of many measures is costly and their relative effectiveness varies.

Policymakers are confronted, in particular, by three issues that are relevant to any downturn in tourism activity. The first is the issue of whether the downturn is sufficiently large to merit offsetting measures. Information that is relevant to this issue includes the magnitude of the decreases in income in tourism activities (tourism in this paper includes travel as well), the dispersion of induced effects across other sectors of the economy and the effects on welfare. The second is the issue of the duration of the downturn. If an economic shock is believed to be long-lasting or even permanent, policymakers should concentrate their attention on minimizing adjustment costs as the economy moves towards a new equilibrium. If a shock is believed to be temporary, the concern should be to insulate the economy from its adverse effects. The third issue concerns the choice of policies for implementation. In this context, policymakers need to evaluate the relative merits of alternative responses and consider the combination of policies and rates of relief that is most cost-effective in raising income and limiting adjustment costs.

Tourism demand is particularly sensitive to security and health concerns. The list of cases where this has taken a sudden and unexpected downturn is long, and includes the effects of the Gulf War on tourism in the Middle East, the Mediterranean, and other European countries, terrorist attacks at Luxor in Egypt in 1997, the Kosovo conflict in 1999, the effects of the foot and mouth disease outbreak in the United Kingdom in 2001 and, most recently, the effects of the September 11 terrorist attacks in the United States. In most of these cases, where governments have actually recognized the importance of the tourism downturn and acknowledged the need for a policy response, they have operated in an environment where very little research into the merits of offsetting policy responses has been conducted.

The case of the September 11 terrorist attacks in the US is a notable example of the difficult decisions that policymakers confront. Following those events, falls in income and employment spread beyond tourism throughout the entire US economy. Federal government response was swift, with the Air Transportation Safety and System Stabilization Act (ATSSSA) being passed on September 22. This act provided federal government loans and compensation to airlines, as well as other financial and safety measures. The Travel Industry Recovery Coalition, comprising 25 tourism organizations, proposed a Six-Point Plan aimed at restoring the levels of activity in the US industry to those existing prior to the September events. The Plan consisted of a series of policy measures covering tourist and workforce tax credits, business loan programs, the extension of allowances for net operating losses, and government and private sector funding for advertising to stimulate travel to and in the United States. Government policymakers were faced
with the difficult decision of how to respond, given the differing costs and relative effectiveness of the different measures.

The choice of policy responses should, ideally, be based on prior estimation of the magnitude and dispersion of the impact of both the downturn and alternative policy measures across different sectors of the economy. Few other studies have quantified the effects of alternative policy responses to tourism crises from an economic perspective, although there have been a number of non-economic studies of the industry, terrorism, and political instability. These include the review by Sonmez (1998) and the earlier volume by Pizam and Mansfeld (1996). More recently Sonmez, Apostolopoulos and Tarlow (1999) discussed the management of the impact of terrorism from the perspective of organizing crisis management taskforces and preparing information. Cross-cultural differences in travel agents’ perceptions of political instability have been examined by Seddighi, Nuttall and Theocarous (2001).

Estimation of the economic impact of changes in the demand for tourism has, typically, been undertaken using input-output (IO) analysis (Archer 1995; Archer and Fletcher 1996; Fletcher and Archer 1991; Henry and Deane 1997). IO modeling is a well-established means of taking account of the inter-sectoral impacts of different types of exogenous “shocks” to an economy. However, this modeling relies on a number of assumptions, such as fixed prices and wages, which may not be appropriate for the circumstances of specific economies. Some of these assumptions have been relaxed in a number of studies, for example Andrew (1997); Wagner (1997); Jensen and Wanhill (2002). An alternative methodology that has been introduced to allow for flexibility in the prices of factors of production and final goods, as well as consistency of income and expenditure, is computable general equilibrium (CGE) analysis. To date, this methodology has been used to examine the economic impacts of tourism in only a small number of countries, for example Hawaii (Zhou, Yanagida, Chakravorty and Leung 1997), Australia (Adams and Parmenter 1995; Dwyer, Forsyth, Madden and Spurr 2000), Indonesia (Sugiyarto, Blake and Sinclair 2002), Spain (Blake 2000), the United Kingdom (Blake, Sinclair and Sugiyarto forthcoming), and in more general cases (Alavalapati and Adamowicz 2000). It has a strong track record in the field of international trade and development (de Melo 1988; Devarajan, Lewis and Robinson 1982; François and Reinert 1997; Shoven and Whalley 1992).

IO modeling typically takes a change in final demand such as an increase (or decrease) in expenditure by tourists and traces the effects of this change through an economy, with each expanding (contracting) sector’s demands for intermediate products leading to further expansion (contraction) in other sectors. The technique is often extended by allowing induced effects, following increases (reductions) in household and government income, to lead to increases (reductions) in private consumption and government expenditure. Crucially there is no constraint on the employment of factor services such as labor and capital, which are available in any quantity at unchanged wage rates. Prices are assumed to be constant because
wage rates do not change, and also because of the simple production and competitive structures inherent in IO models. In reality, however, wages and prices do change when an economy adjusts to a substantial shock.

After September 11 there was noticeable discounting of prices by tourism firms in the United States and around the world. Some workers who become unemployed as a result of a shock take up lower-paid employment in other sectors of the economy. Those who retain their jobs may experience falls in average wages through immediate reductions of overtime working and, in the longer term, through smaller annual wage increases or (more rarely) through actual wage decreases. Wage and price flexibility is an inherent part of the mechanisms through which an economy adjusts to a shock; therefore, it is important to include such flexibility when modeling the effects that a shock will have. IO analysis, by ignoring wage and price flexibility, ignores the ability of workers to find employment in other industries and thus overestimates the effect that a demand reduction will have on GDP and unemployment.

IO models also have difficulties in portraying the effects of policies. Their main focus is to trace final demand shocks through to GDP, so they are incapable of modeling changes in tax rates or subsidies. CGE models, by allowing a difference between the price that consumers pay for products and the money that producers receive for producing them, can incorporate taxes and can allow these tax rates to be changed. Therefore, while an IO model could (under the restrictive assumptions of such constructs) examine the effects of a change in government expenditure, it could not examine the effects of a change in tax rates or subsidies. The ability of governments to give targeted subsidies or tax reductions to specific industries is a significant form of response to tourism crises, and hence needs to be incorporated into a model that seeks to examine government responses.

Therefore, CGE modeling is well suited to examining the economic impacts of exogenous changes in the demand for tourism, such as those associated with acts of terrorism, as well as the impacts of a range of related policy measures. As in the case of the Six-Point Legislative Plan in the United States, these include alternative types of government expenditure, taxation, and credits. A CGE model can take account of differing contexts; for example, differences in the degree of flexibility of money or real wages, changing returns to capital, shifts in productivity, alternative levels of capacity in different economic sectors, and different constraints on the public sector borrowing requirement. The main limitations of the CGE model are the dependence of the results on the estimated values of key parameters and the lack of provision of statistical confidence intervals for the results that are obtained.

However, these can be overcome by ensuring that the parameter values are accurate estimates and/or by undertaking sensitivity analysis to evaluate the responsiveness of the results to changes in the parameter values. The model relies on the use of data from an IO table estimated for a period other than that of the incident in question; for
example, the CGE model for the US uses data from an IO table based on 1992, updated with data for 2001. This is not a serious limitation as, in practice, the structural relationships between the different sectors of the economy rarely change significantly over short time periods. Those cases in which structural relationships do change significantly, such as the case of the oil price shocks, are easy to identify, so that the model can be modified to take them into account. Therefore, the CGE model is appropriate for examining the impact of alternative combinations of microeconomic measures within different macroeconomic settings.

This paper will use a CGE model to estimate the impact of the downturn in tourism, caused by the September events in the United States, on different sectors of the economy. This will be the first time that tourism crisis management in this country has been examined using such an approach and it will build on the record of the immediate impacts of the attack provided by Goodrich (2002). The model will be used to estimate the impact of different policy responses included within the ATSSSA and the Six-Point Plan. This will provide information that is useful for evaluating the relative effectiveness of different policy responses in terms of their impacts on different sectors of the economy, as well as in relation to alternative impact criteria, notably income generation, labor and capital adjustment costs, and employment generation.

The approach used in the paper is applied to the US case, so that the results are specific to the effects of September 11 on the national economy. However, the approach is of general applicability and the case study illustrates the ways in which the model can be used to quantify the effects of alternative types of crises and of the range of possible policy responses, in order to identify those that are most effective in different circumstances. This is straightforward within a CGE modeling context, in which parameters can be changed to suit different real world circumstances.

POLICY RESPONSES TO SEPTEMBER 11

The magnitude of the tourism downturn following September 11 was large, as is evident in Figure 1, which shows the annual growth rates of domestic and international passenger enplanements at US airports from January 2000 to June 2002. A clear downturn is observed in September 2001 in both figures. The percentage decreases in enplanements at this time, compared with the previous twelve months, are 34% for domestic and 23% for international travel. While the September figures include a period in which all commercial air traffic in the United States was grounded, the October figures do not; they show falls of 22% and 33% compared with the previous 12 months (international volume being even lower in October than it was in September) demonstrating the ongoing effects of the crisis. By June 2002 some recovery had taken place, with enplanements down by 11% and 7% over the preceding 12 months. This is still less than the growth that the airline sector would have expected if the September attacks had not occurred.
Federal Government Responses to the Crisis

The immediate government responses to the September attacks included law enforcement activity, disaster relief, and security measures. Eleven days after the attacks, Congress passed the Air Transportation Safety and System Stabilization Act, to “preserve the continued viability of the United States air transportation system” (Library of Congress 2001a). This Act provided federal credit to airlines totaling $10bn; compensation to airlines totaling $5bn; compensation for airlines facing increased insurance premiums; limitation of the extent of liability by airlines for the results of terrorist acts; allowances for airlines to make late payment of excise taxes; compensation for individuals killed or injured in the September attacks; and spending of $3bn on airline safety.

The ATSSSA measures can be categorized into two types: first, those designed to keep the airline sector in operation as a result of the September events and, second, those designed to compensate individuals harmed, physically and economically, as a result of the attacks. The offer of federal credit to airlines, limitation of liability against future terrorist actions, allowances for late tax payments, and measures to increase airline safety were all intended to increase confidence in air travel and prevent the sector from grinding to a halt. Without these measures, airlines would have been unable to borrow capital and would have been refused insurance by brokers. Compensation payments to them, to those facing increased insurance premiums, and to individuals were all measures aimed at providing compensation for harm suffered as a result of the September attacks.

The compensation payments given under the ATSSSA are only applicable where an airline can show that it has suffered economic harm as a result of the attacks. It can claim compensation equal to the lower amount of (a) the economic harm it has suffered, and (b) its August 2001 market share, multiplied by $4.5bn, for passenger traffic, and its market share in August 2001 of cargo traffic multiplied by $500m. As
of the end of 2002, a total of $4.6bn had been paid out to 410 air carriers (Department of Transportation 2002), and examination of pending claims points to all of the $5bn allocation for compensation being paid. The issue of whether this measure fully offsets the cost incurred is open to question. Three cases are possible: the amount of economic harm caused to airlines was between $4.3bn and $5bn, and all the compensation has exactly offset these losses; airlines incurred less than $4.3bn in losses, but the ATSSSA rules enable them to claim for more damages than were incurred; or airlines incurred more than $5bn in losses but the upper limit on compensation prevents them from claiming more. The third case seems to be the most likely, given that initial estimates of the cost of September 11 to the airline sector exceeded this figure. Jones (2001), for instance, in a news report on September 13 estimated that the grounding of aircraft immediately after the attacks would cost airlines $10bn.

The ATSSSA also places some restrictions on any airline that receives compensation or a loan under the act. Most significantly, any such airline must ensure that communities that received its services prior to September 11 continue to do so. In other words, the airline cannot withdraw all its routes from airports where there are no other airlines operating, although the ATSSSA is not specific about maintaining each specific route or the frequency at which flights must continue. The Act also places restrictions on the levels of compensation that such airlines can pay to their own employees.

The ATSSSA was extended on November 19, 2001 with the Aviation and Transportation Security Act (ATSA) (Library of Congress 2001b) which provided additional security measures (such as the introduction of air marshals, improvements to airport security, and permission for flight-deck crews to be armed with non-lethal weapons); provided $1.5bn to airports to pay for these additional security measures; provided $70m for research and development of airport security equipment; extended the ATSSSA’s compensation payments to cover air tour operators and some other air operating companies not previously included in the compensation scheme; and limited the liability of New York City for the events of September 11. Further acts were passed by the federal government in the course of 2001 and 2002, relating to airport security and compensation of victims of terrorism (Library of Congress 2001c,d).

The Travel Industry Recovery Coalition Plan

The Travel Industry Recovery Coalition (TIRC)—a group of industry members formed to lobby government for more action in response to September 11—proposed an additional Six-Point Plan for public policy designed to “restore the economic health of the US travel and tourism industry to pre-September 11 levels” (TIA 2002). The six points were that the federal government should provide a $500 tax credit for travel originating and occurring within North America on air, cruise, train, bus, rental car, and hotel/motel expenditures; expand loan programs to small businesses; offer a workforce tax credit for employment in the
industry; supply substantial federal funding for marketing campaigns; increase tax allowances to enable businesses to offset losses sustained because of September 11 against future earnings; and restore full tax deductibility for business entertainment expenses that are currently only 50% deductible.

The TIRC plan addresses issues not tackled in the ATSSSA. Although the latter provided compensation to airlines, it did not provide compensation to other related businesses. The TIRC plan is not focused on the airline sector but aims to provide support for the whole tourism industry (notably including businesses in other transportation sectors). The measures included in the plan can be classified into two categories: first, those designed to stimulate economic activity across the whole industry in order to offset the downturn caused by the September events and, second, those aiming to increase liquidity and to prevent firms from incurring major costs and possibly going out of business. Loan programs and tax allowances fall into the second category. The first category supplies direct subsidies for production by the tourism industry, such as the compensation provided for airlines, and for consumer expenditure (for example, the proposed tax credits for expenditure on tourism). The first category of measures has effects on the economy that are amenable to quantification. They are also measures that incur significant costs, so that it is particularly useful for the government to have some knowledge of their relative effectiveness. The CGE model will be developed to estimate the relative magnitudes of this category of policy measures.

**Budget Measures**

In December 2001, the US President introduced an economic security plan to Congress that was still under consideration by the Senate in mid August 2002. The Budget for 2003 (OMB 2002:406,409) includes provisions for this economic security plan, budgeting for tax cuts of $62bn in 2002 ($65bn in 2003), and $27bn increased expenditures in 2002 ($8bn in 2003). The economic security plan is focused on the Economic Security and Worker Assistance Act (ESWAA), which would, if passed by the Senate, reduce some business tax rates; offer temporary assistance for needy families; and provide tax benefits for business and private property in New York City that was damaged as a result of the September attacks (limited to a total of $15bn). In addition, the ESWAA includes other measures to extend a number of tax provisions that would otherwise expire, provide tax provisions for disaster victims, and other miscellaneous and technical provisions. It should be noted that the largest economic effects of the security plan entail tax breaks on direct personal and business taxation, which have distributional implications but are otherwise intended as being a fiscal measure to stimulate general economic activity.

The 2003 budget also contains extra September related expenditure on defense and homeland security. The defense budget is set to rise from $306bn in 2001 to $331bn in 2002 and $369bn in 2003 (OMB 2002:101). Of the 2003 expenditure, $48bn is an increase over previous
plans (Tobin 2002). Homeland security expenditure is a category created in response to September 11, and will rise to $37.7bn in 2003 (OMB 2002:399). Tobin sees the increased expenditures on defense and homeland security as having a fortunate by-product of being a direct fiscal stimulus to the economy, and discusses the merits of tax reductions covered in the economic stimulus package relative to these expenditures. He concludes that the defense and homeland security measures should be brought forward from 2003 and introduced as early as possible as a means of stimulating the US economy. It should be noted that the combined increase in expenditures on these categories is $86bn, which is significantly larger than the tax reductions in the economic security plan, and also larger than the ATSSSA/ATSA measures and the TIRC’s Six-Point plan. Therefore, they entail greater costs to the federal government in terms of its economic policy response to September 11.

Modeling Tourism in the Wider Economy

The effects of the September crisis and the relative impacts of the different policy responses on tourism can be examined using a CGE model of the US economy. It includes 98 sectors and commodities with 53 manufacturing, 35 service, and 10 primary sectors. Each uses tourism intermediate inputs and other intermediate inputs of each of the 98 commodities, together with capital services and inputs of 23 types of labor. Each sector produces one or more of the 98 products, although most sectors mainly produce their own product. Each sector is taxed at a rate which encompasses all forms of indirect taxation in the US economy. A representative private household receives all factor income, pays income taxes to the government, and spends its income on domestic tourism, private (non-tourist) consumption, and savings. The government receives all tax income and spends it on tourism and non-tourism government consumption. Trade occurs under the assumption (Armington 1969) that goods produced in the United States differ from goods in the same classification imported from abroad. Exports are also qualitatively different from goods produced for the domestic market. The model allows for unemployment in each of the 23 labor markets and for under-utilization of capital.

Tourism flows exist for private households (domestic tourism and tourism imports) government, non-residents, and each of the 98 production sectors that purchase goods used for business tourism. Each of these separate flows, is modeled for tourism trips with or without air travel. Substitution can occur between air and non-air trips, for example, in response to cheaper flights due to ATSSSA compensation payments. The parameters in the demand functions for tourism are changed to simulate the effects of September 11 on the demand for tourism, with air travel trips becoming less attractive.

The model is formulated so that government expenditure on goods and services is exogenous, and this expenditure on trips is changed exogenously to simulate the effects of September 11. The government adjusts its budget through lump-sum transfers to private households.
Net foreign savings are fixed, so that the changes that are modeled do not affect international capital flows. World market prices are assumed to be determined exogenously. These conditions are known as the government, macroeconomic, and external closures.

Only a few of the many variables in the model are reported here. Constant dollar GDP is a standard measure of economic activity. The net effect on the government budget is the net change in (federal, state, and local) tax revenues minus extra expenditures incurred as a result of September 11. Constant dollar factor adjustment is a measure of capital and labor adjustment, given in dollar terms. More specifically, it is the constant dollar value of all factors that move from their original sector of employment, either into another sector or to unemployment or, in the case of capital, underutilization. It does not measure the costs of adjustment, retraining, retooling, and payments of unemployment benefits, although it is an indicator of the relative size of these adjustment costs. Relative factor adjustment is a similar measure, but is given as a percentage of all factor employment rather than in constant dollars. Constant dollar employment shows the real value of labor employment which, unlike the previous two measures, includes the net effect of labor being re-employed in other sectors. Full-time equivalent employment shows the net employment pattern in terms of full-time equivalent workers, while FTE jobs lost shows the loss as workers are displaced from their original sector of employment, either to be unemployed or re-employed in another sector. Two further indicators show the number of jobs lost in airline and accommodation sectors.

Data are obtained from various Bureau of Economic Analysis sources. The benchmark input-output table for 1992 (Lawson 1997) is used in conjunction with data for GDP by originating industry (Lum and Moyer 2001) and national income and product account data (Bureau of Economic Analysis 2002) to construct an input-output table for the second quarter of 2001. Data from the prototype tourism satellite account (Kass and Okubo 2000; Okubo and Planting 1998) are combined with estimates of tourists’ use of motor vehicles and vacation homes (Okubo, Fraumeni and Fahim-Nader 2001) and updated using national income and product account data to provide estimates of tourism consumption in the second quarter of 2001. These are similar to the BEA’s own release of updated quarterly tourism satellite account results except for the inclusion of tourists’ use of motor vehicles and vacation homes, as recommended by Okubo et al. (2001). Employment data are obtained from the Bureau of Labor Statistics (BLS 2002) and updated using GDP by originating industry and national income and product account data to provide data on employment by labor type in the second quarter of 2001.

Results without Offsetting Policies

The first set of results from the model indicate the effects of the September 11 events in the absence of any offsetting policy responses. It is clear that there are severe effects in terms of a variety of criteria,
including income, government revenue, labor and capital adjustment costs, and employment and job losses (Table 1). As the first column of the table shows, the fall in tourism expenditures reduces GDP to almost $30 billion less than it would otherwise have been, and worsens the government budget by over $7 billion. Factor adjustment, the amount of capital and labor that leave their original sector of employment, is $31 billion. The loss of employment is high, at 383,000 full time equivalents. A total of 559,000 jobs are lost, of which 203,000 are in airlines: with 174,000 in accommodation establishments.

The tourism effects of September 11 can be decomposed into the effects of reduced demand for air travel and tourism trips by international and domestic tourists, as is shown in the second and third columns in Table 1. It is apparent that the reductions in demand by US residents are dominant for all types of effects, but particularly for factor adjustment costs and for FTE jobs lost in the airline sectors. This demonstrates the importance of domestic and inbound tourism in the US economy and the significant effects that decreases in domestic demand can bring about. The effects of the reductions in demand by international tourists are lower but are spread more widely across the economy.

The Results of Crisis Management Policies

Given the finding that the effects of the decreases in tourism demand brought about by September 11 are severe, the related ques-

<table>
<thead>
<tr>
<th>Type of Effects</th>
<th>Effects of Reduced Demand for Domestic Air Travel and Tourism</th>
<th>Effects of Reduced Demand by International Tourists</th>
<th>Effects of Reduced Demand September 11, Without Policy Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total change in tourist spending ($bn)</td>
<td>−50.69</td>
<td>−15.89</td>
<td>−40.88</td>
</tr>
<tr>
<td>Constant dollar GDP ($bn change from base)</td>
<td>−27.27</td>
<td>−10.54</td>
<td>−17.97</td>
</tr>
<tr>
<td>Net effect on government budget ($bn change from base)</td>
<td>−7.27</td>
<td>−2.60</td>
<td>−4.94</td>
</tr>
<tr>
<td>Constant dollar factor adjustment ($bn)</td>
<td>30.93</td>
<td>12.88</td>
<td>21.44</td>
</tr>
<tr>
<td>Relative factor adjustment (%)</td>
<td>0.75</td>
<td>0.32</td>
<td>0.49</td>
</tr>
<tr>
<td>Constant dollar employment ($bn)</td>
<td>−13.57</td>
<td>−5.96</td>
<td>−7.85</td>
</tr>
<tr>
<td>FTE employment (’000)</td>
<td>−383</td>
<td>−155</td>
<td>−248</td>
</tr>
<tr>
<td>FTE jobs lost (’000)</td>
<td>559</td>
<td>198</td>
<td>414</td>
</tr>
<tr>
<td>FTE jobs lost in airlines (’000)</td>
<td>203</td>
<td>42</td>
<td>160</td>
</tr>
<tr>
<td>FTE jobs lost in hotels and other accommodation establishments (’000)</td>
<td>174</td>
<td>42</td>
<td>146</td>
</tr>
</tbody>
</table>

Note: columns two and three do not sum to column one because of increased demand for domestic travel and tourism by non-air transport.
tion is whether the implementation of crisis management policy responses succeeded in offsetting the downturns. The CGE model was used to estimate the effects of all of the quantifiable policy measures that were implemented by the ATSSSA and ATSA; i.e. compensation to airlines and individuals, spending on airline safety and expenditure on marketing, and the effects of September 11 with and without these crisis management responses are included in Table 2.

Perhaps the most important finding in the table is that the policy responses are very effective in offsetting the adverse effects of the crisis. The fall in GDP is much lower than it would otherwise have been, at under $10 billion compared with nearly $30 billion in the without-policy case. The measures worsen net government revenues by the relatively large amount of around $11 billion, which includes $5 billion in airline compensation and $4.5 billion in security spending outlined in the ATSSSA and ATSA acts. The policies are less effective in decreasing the factor adjustment costs relating to the crisis, almost halving the value of the labor and capital that leave their original sector of employment. The loss of employment is less than half of what it would otherwise have been, so that the number of people affected is below 150,000 compared with almost 400,000 in the non-response case. The number of FTE jobs lost is around 60% of the total that would otherwise have occurred, at 335,000 compared with over half a million without a policy response. The number lost in the airline sector is 93,000 (28% of all jobs lost) after the policy response, compared with over 200,000 (36% of all jobs lost) without a policy response.

The model was also used to estimate the relative and absolute effectiveness of the ATSSSA and ATSA measures on the worst hit sectors of the economy, with respect to the different measurement criteria (changes in income, labor and capital adjustment, and job loss). The

### Table 2. Effects of September 11 without/with ATSSSA and ATSA Measures

<table>
<thead>
<tr>
<th>Types of Effects</th>
<th>Effects of September 11, Without ATSSSA and ATSA Policy Responses</th>
<th>Effects of September 11, Including ATSSSA and ATSA Policy Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total change in tourist spending ($bn)</td>
<td>−50.68</td>
<td>−37.47</td>
</tr>
<tr>
<td>Constant dollar GDP ($bn change from base)</td>
<td>−27.27</td>
<td>−9.34</td>
</tr>
<tr>
<td>Net effect on government budget ($bn change from base)</td>
<td>−7.27</td>
<td>−11.14</td>
</tr>
<tr>
<td>Constant dollar factor adjustment ($bn)</td>
<td>30.93</td>
<td>17.42</td>
</tr>
<tr>
<td>Relative factor adjustment (%)</td>
<td>0.75</td>
<td>0.49</td>
</tr>
<tr>
<td>Constant dollar employment (% )</td>
<td>−13.57</td>
<td>−3.65</td>
</tr>
<tr>
<td>FTE employment (’000)</td>
<td>−383</td>
<td>−144</td>
</tr>
<tr>
<td>FTE jobs lost (’000)</td>
<td>559</td>
<td>335</td>
</tr>
<tr>
<td>FTE jobs lost in airlines (’000)</td>
<td>203</td>
<td>93</td>
</tr>
<tr>
<td>FTE jobs lost in hotels and other accommodation</td>
<td>174</td>
<td>141</td>
</tr>
<tr>
<td>establishment (’000)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
results are provided in Tables 3 and 4. The former shows the fall in constant-dollar employment in the ten sectors that are affected the most by the crisis. Air transport is the worst hit sector prior to the policy responses, but when policy responses are included, hotels occupy this position. A total of 35 of the 98 sectors lose out in terms of factor employment from September 11, with 31 of them still losing after the policy response.

Table 4 shows the results of modeling several different possible policy responses to the crisis. Each of these involves a specific type of subsidy scheme, which can be interpreted as an equivalent tax reduction. The different types of crisis management responses are divided into five main types in Table 4: subsidies to production, to consumers’ expenditure, to labor employment, to capital profits, and more general fiscal stimulus measures. The former provides a direct subsidy to sectors that are particularly affected. The payments to consumers’ expenditure subsidize (or provide tax relief to) tourism expenditure. Those to labor and capital give specific support to these factors of production (in the case of labor, to all of the 23 types of labor). Thus, for example, compensation to airlines is included in the former, while tax credits for personal and business expenditure on tourism are included in the second category and a workforce tax credit is included in the third. This enables the effects that these policies have after September 11 and the initial policy responses of the ATSSSA and ATSA to be compared. Marginal changes are made to the appropriate subsidy instrument to facilitate comparisons of the effects of the policies. The change in constant dollar GDP and the other indicators shown are divided by the change in net government revenue as a result of the marginal subsidy change to give the marginal effects per million dollars of subsidy expenditure.

Table 3. Fall in Constant-Dollar Factor Employment ($bn Change from Base)

<table>
<thead>
<tr>
<th>Industry</th>
<th>Effects of September 11, Without ATSSSA and ATSA Policy Responses</th>
<th>Effects of September 11, Including ATSSSA and ATSA Policy Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotels</td>
<td>−7.3</td>
<td>−5.9</td>
</tr>
<tr>
<td>Air transportation</td>
<td>−11.0</td>
<td>−5.0</td>
</tr>
<tr>
<td>Eating and drinking places</td>
<td>−1.9</td>
<td>−1.2</td>
</tr>
<tr>
<td>Food and kindred products</td>
<td>−1.2</td>
<td>−0.9</td>
</tr>
<tr>
<td>Arrangement of passenger transportation</td>
<td>−1.5</td>
<td>−0.7</td>
</tr>
<tr>
<td>Construction</td>
<td>−1.1</td>
<td>−0.6</td>
</tr>
<tr>
<td>Other accommodation establishments</td>
<td>−0.7</td>
<td>−0.6</td>
</tr>
<tr>
<td>Fitness, sport and recreation clubs</td>
<td>−0.7</td>
<td>−0.6</td>
</tr>
<tr>
<td>Drugs and cleaning preparations</td>
<td>−0.4</td>
<td>−0.3</td>
</tr>
<tr>
<td>Theatres and entertainers</td>
<td>−0.3</td>
<td>−0.2</td>
</tr>
</tbody>
</table>
A production subsidy to the airline sector (which can also be interpreted as a tax reduction) increases GDP by $3.1 million for every million dollars in subsidy. It has a minimal effect on the net government budget, as it is so effective at halting the decline of the airline sector and reducing unemployment that the stimulated economic activity generates almost as much revenue through direct and indirect taxation as is spent on the airline subsidy. Every $1 million of airline

<table>
<thead>
<tr>
<th>Type of Subsidy</th>
<th>GDP Effect ($m)</th>
<th>Factor Adjustment Saved ($m)</th>
<th>Total Jobs Saved</th>
<th>Airline Jobs Saved</th>
<th>Accommodation Jobs Saved</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Per $1m Production Subsidy to:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airlines</td>
<td>3.1</td>
<td>-0.02</td>
<td>1.6</td>
<td>27.8</td>
<td>20.7</td>
</tr>
<tr>
<td>Hotels</td>
<td>2.0</td>
<td>-0.4</td>
<td>0.6</td>
<td>11.9</td>
<td>-0.1</td>
</tr>
<tr>
<td>Other accommodation</td>
<td>1.8</td>
<td>-0.1</td>
<td>1.6</td>
<td>23.7</td>
<td>-1.5</td>
</tr>
<tr>
<td>Eating &amp; drinking places</td>
<td>0.7</td>
<td>-0.8</td>
<td>0.7</td>
<td>22.8</td>
<td>0.2</td>
</tr>
<tr>
<td>Other entertainment sectors</td>
<td>-0.1</td>
<td>-1.1</td>
<td>-0.2</td>
<td>0.6</td>
<td>-0.2</td>
</tr>
<tr>
<td>Airlines, hotels and other accommodation</td>
<td>2.5</td>
<td>-0.2</td>
<td>1.1</td>
<td>20.2</td>
<td>10.2</td>
</tr>
<tr>
<td><strong>Per $1m Consumption Subsidy on:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business air travel trips</td>
<td>2.7</td>
<td>-0.3</td>
<td>0.5</td>
<td>7.8</td>
<td>1.3</td>
</tr>
<tr>
<td>All business trips</td>
<td>2.4</td>
<td>-0.3</td>
<td>0.4</td>
<td>6.7</td>
<td>0.8</td>
</tr>
<tr>
<td>International trips</td>
<td>2.0</td>
<td>-0.04</td>
<td>1.1</td>
<td>19.4</td>
<td>5.1</td>
</tr>
<tr>
<td>All air trips</td>
<td>1.6</td>
<td>-0.4</td>
<td>0.7</td>
<td>12.5</td>
<td>4.7</td>
</tr>
<tr>
<td>Domestic air trips</td>
<td>1.4</td>
<td>-0.6</td>
<td>0.5</td>
<td>9.0</td>
<td>0.6</td>
</tr>
<tr>
<td>All tourism trips</td>
<td>1.3</td>
<td>-0.6</td>
<td>0.4</td>
<td>7.7</td>
<td>2.2</td>
</tr>
<tr>
<td>All domestic tourism</td>
<td>1.1</td>
<td>-0.7</td>
<td>0.2</td>
<td>4.8</td>
<td>1.5</td>
</tr>
<tr>
<td>Domestic air travel trips</td>
<td>0.3</td>
<td>-0.9</td>
<td>0.5</td>
<td>10.2</td>
<td>7.4</td>
</tr>
<tr>
<td>All domestic trips</td>
<td>0.2</td>
<td>-0.9</td>
<td>0.1</td>
<td>3.7</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Per $1m Employment Subsidy in:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airlines</td>
<td>3.1</td>
<td>-0.01</td>
<td>1.6</td>
<td>32.4</td>
<td>25.5</td>
</tr>
<tr>
<td>All tourism sectors</td>
<td>2.6</td>
<td>-0.2</td>
<td>1.2</td>
<td>28.4</td>
<td>12.9</td>
</tr>
<tr>
<td><strong>Per $1m Subsidy to Profits in:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airlines</td>
<td>3.1</td>
<td>-0.1</td>
<td>1.6</td>
<td>10.1</td>
<td>2.3</td>
</tr>
<tr>
<td>All tourism sectors</td>
<td>2.3</td>
<td>-0.3</td>
<td>1.0</td>
<td>-2.0</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Per $1m of:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct tax cuts</td>
<td>0.2</td>
<td>-0.9</td>
<td>-0.1</td>
<td>-0.5</td>
<td>-0.2</td>
</tr>
<tr>
<td>Military expenditure</td>
<td>0.2</td>
<td>-1.0</td>
<td>0.3</td>
<td>-2.3</td>
<td>-0.1</td>
</tr>
</tbody>
</table>
sector subsidy reduces factor adjustment by $1.6 million and reduces
the total number of jobs lost by 27.8, of which 20.7 are saved in the
airline sector itself, but only 0.1 jobs are saved in the accommoda-
tion sectors.

The results in the table show that the provision of subsidies targeted
to the airline sector are the most effective policy response according
to most criteria. An airline production subsidy outperforms all other
types in each of the criteria with the exception of the number of
accommodation jobs lost. While more efficient in these terms, how-
ever, an airline subsidy fails to take account of job losses outside the
sector that are caused by the fall in demand from tourists who would
have traveled by air. The provision of subsidies to accommodation
establishments (though less effective than a subsidy to airlines) is
reasonably effective at boosting GDP and saving jobs in this sector.
These subsidies are significantly more effective than those to catering
and entertainment. In fact, subsidies to the latter can have the effect
of worsening GDP and labor and capital adjustment, as they encourage
workers to move out of the airline and accommodation sectors, thereby
increasing the job losses in these sectors. This demonstrates that poorly
targeted subsidies can not only fail to alleviate adjustment costs, but
can also add to them.

Consideration of the effects of subsidizing tourism consumers shows
that such provision for air travel expenditure is more effective than
the provision of a more generalized subsidy for all types of tourism
expenditure, as shown by the item “all domestic tourism”. The results
for the latter are indicative of the effects of providing consumers with
a tax credit for expenditures on air, cruise, train, bus and rental car
travel, and accommodation, as requested in the first point of the TIRC
Six-Point Plan. Such a subsidy performs badly because it is not focussed
on the types of expenditures that have fallen since September 11
(expenditures on trips involving air travel). Similarly, subsidies for
expenditure on all resident trips are less effective than those directed
solely towards air travel. Payments for business air trips are the most
beneficial in terms of GDP (though not in terms of adjustment costs)
because business travel, as an input into production in other sectors,
increases the efficiency of those other sectors. Subsidizing trips of inter-
national tourists has the greatest effect in reducing adjustment costs
and job losses and has the second largest effect on preserving jobs in
the airline sector. Supporting resident air trips preserves more jobs
in this sector per $ million of subsidy than any of the other tourism
expenditure subsidies. Subsidizing all air trips spreads the effects of the
job savings more evenly across the airline and accommodation sectors.

Subsidies to employment in airlines are just as efficient in terms of
GDP and net budgetary effect as airline production ones, but have a
much greater impact on saving jobs in the airline sector, as would be
expected. Profit subsidies perform just as well in terms of GDP and
factor adjustment, but perform badly in terms of saving jobs. However,
while there is inevitably some political pressure to minimize job losses,
there is also a need to minimize the adjustment costs to capital. The
employment and capital subsidies to all tourism establishments
Cuts in direct taxation and military expenditure both perform relatively poorly in terms of stimulating GDP, reducing factor adjustment, and saving jobs in sectors affected by September 11. They are also expensive in budgetary terms, as very little of the tax cut and military expenditure is returned to the government through increases in other forms of taxation, as the net budget effect of every $1 million spent is close to $-1 million. While these policies may perform better in the context of a government response to general economic recession, they are not a particularly efficient means of counteracting the fall in tourism demand following September 11.

CONCLUSION

Three issues of central importance to tourism crisis management were posed at the beginning of this paper: first, that of whether the downturn in activity associated with the crisis is sufficiently large to merit offsetting measures; second, whether the shock is sufficiently long-lasting to merit measures to minimize adjustment costs; and, third, what types of policies should be implemented. The analysis of tourism in the United States and the application of the CGE model to the case of the September 11 events has offered substantive answers to these questions. The results provided by the model indicate that, in the absence of offsetting policies, the terrorist attacks would have had the effect of decreasing GDP by almost $30 billion, with the airline sector, followed by the accommodation sector, being particularly badly affected. The total number of jobs lost would have exceeded half a million. Hence, it is clear that the downturn in activity was, indeed, a serious cause for concern.

The magnitude of the adverse effects stemming from the September events was so great that any possibility of short duration was precluded. Moreover, examination of statistics for international enplanements showed that the decreases in the month of October were even greater than those in September and that the decreases below the averages for the same months in the previous year were ongoing. The associated declines in the use of labor and capital in affected sectors, notably airlines and accommodation, are not matched by immediate increases in their use elsewhere, owing to imperfections in information, costs of intersectoral factor mobility and other frictions within the market. For these reasons, along with the social costs of unemployment and dislocation, there is a clear case for policies to decrease the adjustment costs associated with the September events.

Policy responses to crises can be considered under two categories. The first involves relatively low cost measures to restore confidence and increase liquidity. These include the provision of credits or loans that involve subsequent repayment, measures to limit the liability of businesses to acts of terrorism, deferred tax payments, and low cost tax allowances. The second category involves significant costs and, as
governments have scarce resources, pose the question of which policy(ies) are most cost-effective. Examples include expenditure on compensation for airlines and measures to increase their safety, included within the ATSSSA, and proposals for tax credits for consumers or workers in tourism, included in the TIRC Six-Point Plan.

Examination of the cost-effectiveness of different types of policy response using the CGE tourism model demonstrated that the implementation of crisis management policies is very effective in reducing the adverse effects of the September events. However, the relative effectiveness of the different policy responses varies considerably. The results from the model showed that a policy of directing assistance towards the airline sector in the form of subsidies is the most efficient instrument for dealing with the tourism crisis in terms of the majority of the criteria considered. Subsidies for air travel, particularly by business people, are also an effective policy response, although such measures are a less effective way of saving jobs and maintaining GDP than the provision of assistance to the sector itself. The provision of a subsidy for accommodation is very effective in preserving jobs in this sector at a fairly small cost in terms of the net government budget. Its effects on GDP are two-thirds those of the airline production subsidy, although the value of factor adjustment saved is lower. The effects on total jobs saved are lower than those resulting from the airline production subsidy, because the accommodation sector was less severely affected than the airline sector and is also used on trips that do not involve air travel. The TIRC proposal for an individual tax credit for tourism expenditures corresponds closely to subsidizing all resident trips. This form of subsidization is relatively ineffective in terms of its impact on GDP and on reducing adjustment costs.

The overall conclusion is that directing subsidies to the sector that is most severely affected by the crisis is the most efficient policy response in terms of both GDP and the total number of jobs saved. Policymakers should be very careful in their decisions as to which sectors to assist, as the provision of subsidies for those relatively unaffected can even be counter-productive. This was indicated by the case of the increases in job losses and adjustment costs that a subsidy for the entertainment sector would have brought about. A related overall conclusion is that subsidies for production are more beneficial than subsidies for consumers’ expenditure on tourism. In the case of the September events, the provision of compensation to US airlines was the most appropriate policy, even though the level of ATSSSA compensation payments to an airline was related to the airline’s market share prior to the crisis. An alternative form of subsidies would be to relate them to an airline’s current level of output. This would have the advantage of providing the sector with further incentives to reduce ticket prices, thereby stimulating traffic volumes. A policy of subsidies to accommodation would be particularly beneficial in saving jobs in this labor-intensive sector, so that a strategy of assistance for both sectors could be considered.

Although these conclusions relate to the case of the September 11 events, it is probable that they can be generalized to other types of
crises in tourism. Thus if, for example, the hotel and catering (restaurant) sectors were affected most adversely by particular events, it is likely that a policy of direct subsidies for such establishments would be the most effective response. Examination of the relative effectiveness of different types of policy responses to different types of crises in different countries could be undertaken using a modeling approach similar to that employed in this paper. Further research on this issue would assist governments and organizations to formulate their policy responses so as to manage tourism crises, and maintain income and employment, in the most effective manner.

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