Social and Economic Impacts of SARS Outbreak in Thailand*

Acharee Steinmueller**

INTRODUCTION

Tourism is one of the most remarkable economic and social aspects of the past century. The number of arrivals internationally increased from 25 million in 1950 to over 700 million in 2002, with the average annual growth rate being 6.6 percent (WTO 2003a). Development of tourism was particularly strong in Asia and the Pacific with a rate double that of the world (12.9%), increasing from 0.2 million to 131.3 million arrivals. Some countries and areas in Asia and the Pacific are among the 25 top tourist destinations globally, namely, China, Hong Kong, Malaysia, Thailand and Singapore. Moreover, the Lao People's Democratic Republic, Cambodia, Iran, Malaysia and China are the world's top emerging tourist destinations; their rates of growth increased at a rate twice that of the global average in the period from 1995 to 2002, increasing by at least 150,000 arrivals. These phenomena indicate the significance of the tourism sector in Asia and the Pacific.

In 2002, tourism represented approximately 7 percent of the value of the export of goods and services worldwide, occupying the fourth position in the ranking after chemicals, automotive products and fuels (WTO 2003a). When considering service exports exclusively, the share of tourism exports increased to nearly 30 percent (WTO 2003a). However, despite the increases in tourism exports worldwide, the tourism industry has experienced unexpected and uncertain circumstances such as warfare in the Persian Gulf in 1991, the terrorism attacks of September 11, 2001, and the outbreak of SARS (severe acute respiratory syndrome) in Asia and Canada in 2003. The unexpected SARS outbreak had a negative impact on the global economy owing to the lack of information related to the new disease, which made people fearful. In fact tourism was the major industry to be affected by the SARS outbreak, especially in Asia.

Regarding the number of SARS cases reported by the World Health Organization (WHO), about 63 percent of the total number of cases were in China (5,326 cases); Hong Kong (1,755); Singapore (206); Taipei, Taiwan (692); Vietnam (63); world (8,459) (ADB 2003). The SARS outbreak caused severe impacts for Asian economies, even in countries such as Thailand where there was no SARS outbreak. Thus, Thailand will be used as a case to assess the social and economic impacts of SARS by applying Computable General Equilibrium (CGE) Modeling.

The paper is divided into five parts. The first part consists of introduction and statement of objectives. The second part includes a review and assessment of the impact of the aforementioned shocks on tourism, emphasizing SARS. Tourism income stability and an assessment of the impact of SARS on the Thai economy are presented in the third and fourth sections. The final section provides results and discussion.

FACTORS AFFECTING TOURISM

Tourism is widely recognized for the important role it can play in generating income, employment and tax revenues, in alleviating balance of payments constraints and in contributing to regional and national economic development. However, the demand for tourism and the choice of tourist destinations may be susceptible to large fluctuations in income, inflation and exchange rates, and, of course, unexpected events. Unexpected events related to political, social, economic, cultural, and environmental occurrences might affect tourism negatively, for example, political changes, wars and conflicts, and disease outbreaks.

Political instability causes adverse effects on tourism demand worldwide. For example, political instability in the Mediterranean showed the adverse effects on tourism demand by European countries of tourist origin and that of the United States using a dynamic model of demand for Mediterranean tourism

* *The paper was prepared as part of the work on "Tourism income and stability" under the project entitled "Integrated Development of Sustainable Tourism in the Mekong Region" with the financial support from the National Research Council of Thailand and Social Research Institute, Chiang Mai University. The author would like to express her gratitude to Prof. Dr. Mingsarn Kaosa-ard and Dr. Somchai Jitsuchon for their valuable comments.*

** *Dr. Acharee is Senior Research Specialist, TDRI's Natural Resources and Environment Program.*

(Syriopoulos 1995). The impact of the Persian Gulf War during the period 1991-1992 on the number of visitors to Thailand was detrimental, i.e., an estimated reduction of 0.6 million in the number of international visitors per year for two years, calculated by simultaneous system equations (TDRI 1997).[1] Another study which focused on the impact on Thailand's various tourism markets also confirmed that the Persian Gulf War had a strongly negative impact in the short term, with visitors from East Asia declining by 14 percent and others 16 percent (TDRI 2001).[2] A conflict within Thailand during that period also had a negative impact on tourism, especially in view of security concerns.

Other examples also exist: during the period October 1999 to April 2000, when large-scale riots broke out in Indonesia, there was a drastic drop of 6,860 tourist arrivals and estimated total tourism losses valued at US$ 329,280 to US$ 658,560 in the Gili Islands compared with the same period one year previously (Soemodinoo et al. 2001 cited by Kim et al. 2004). Another example from Indonesia is the Bali terrorist attack on October 12, 2002; tourism to Indonesia suffered negative growth (–2.3%), but the rest of Southeast Asia ended the year with 5 percent growth in tourism.

The terrorist attacks of September 11, 2001 caused significant downturns in tourism demand in the United States and worldwide. America's tourism performance has been affected by declines following those events (–5.3%, 2000-2002). This led to a regional ranking change for the first time in 2001, as America's decline was overwhelmed by the exceptional performance of Asia and the Pacific, which ranked second in 2001 and 2002 (WTO 2003a). The downturns in tourism demand worldwide created losses, especially in hotel business performance; for example, the corporate management operating margin[3] of the Four Seasons Hotel decreased from 67.9 percent in 2000 to 59.3 percent in 2001 and to 55.4 percent in 2002 (Four Seasons Hotel 2003).

Uncertainty has also played a major role in tourist markets, for example, in 2002 the threat of new terrorist attacks and the looming conflict in Iraq. These adverse conditions resulted not so much in decreases in the number of visitors and the amount of receipts from tourism, but shifted demand toward trips to domestic and familiar destinations that were closer to home, where tourists could travel by car, coach or train instead of by airplane (WTO 2003b; Richards 2003).

Disease epidemics or outbreaks are considered as major unexpected factors, which might affect the tourism industry; examples include foot and mouth disease (FMD) in the United Kingdom and SARS in Asia. The FMD epidemic, which occurred during the period from February to March 2001 in the United Kingdom, caused estimated direct losses to the tourism industry (between March and August 2001) valued between £ 2.7 billion and £ 3.2 billion in terms of value added (Richards 2003).

SARS started in Asia and resulted in a global alert being issued by WHO on March 12, 2003. As mentioned previously, the outbreak of SARS in Asia caused adverse social and economic impacts in the region, especially in the tourism and transport sectors (airlines), with the total number of SARS cases reaching 8,459 cases.

The economic impacts of SARS on the travel and tourism sector (T&T) in China, Hong Kong, Singapore and Vietnam were estimated applying the Tourism Satellite Account (TSA). The results indicated a reduction in T&T GDP by 25 percent for China, and close to 40 percent for Hong Kong and Singapore (Table 1). Nonetheless, China's economic fundamentals were not weakened by SARS; those fundamentals included high foreign exchange reserves, cheap labor, current account surplus, strong domestic investment, and strong inflows of foreign direct investment (FDI) (ADB 2003; Fan 2003). The manufacturing sector, which contributes about half the economic growth rate, was not seriously affected by SARS. Tourism was the biggest casualty of SARS, including the related sectors such as the aviation industry, restaurants and hotels, and small and medium-sized enterprises. In addition, the weaker impact on Vietnam (a reduction in T&T GDP by 15%) can be partly explained by the Vietnamese government's ability

Table 1 Estimated Economic Impact of SARS on the Travel and Tourism Industry in Four Economies

Items	China (6 months' impact)	Hong Kong (4 months' impact)	Singapore (4 months' impact)	Vietnam (3 months' impact)
T&T industry GDP (US$ billion)	-7.6	-1.21	-	-
T&T industry GDP (percent)	-24.5	-41.10	-43.0	-15.0
T&T industry employment (000)	-2,802.2	-27.30	-17.5	-27.0

Source: WTTC. 2003. Tourism Satellite Account created by Oxford Economic Forecasting (OEF).

to control the SARS outbreak within a month of the outbreak. The impact of SARS depended on the seriousness and duration of the outbreak and the structure of the economy concerned, particularly the importance of service industries in GDP (Fan 2003).

Another study on assessment of the impact of SARS in developing Asia[4] revealed the chain of effects in an economy, such as inflows of foreign tourists falling sharply, which leads to cuts on both sides of the balance-of-payments service account and more losses in travel-related jobs (ADB 2003). Ultimately, all channel effects have an impact on GDP growth. The economic loss attributable to SARS was assessed using the Oxford Economic Forecasting (OEF) Model.[5] The results indicate that SARS caused significant losses in several Asian economies in terms of lost GDP: in nominal terms, about US$ 18 billion for East and Southeast Asian economies, or a loss of about 0.6 percent of the growth rate for these economies in 2003; the total final costs are close to US$ 60 billion, or about 2 percent of GDP (Tables 2 and 3).

In comparing the impact of SARS and the Iraq conflict on expected tourism revenue, the results are mixed among Asian countries and areas. The tourism revenue of South Korea, Indonesia, Malaysia, and Singapore is expected to be much lower as a result of both SARS and the Iraq conflict, while some economies, such as China, Hong Kong and Thailand, could be expected to benefit from the increase in tourism revenue assuming the effects of the conflict in Iraq (Table 2).

THAILAND TOURISM INCOME STABILITY[6]

Thailand ranks 18th in terms of worldwide arrivals in 2002, with 10.9 million international tourist arrivals; its share is equivalent to 1.5 percent of the global total, or 8.3 percent of that for Asia and the Pacific (WTO 2003a). Regarding international tourism receipts, Thailand ranks 15th, with revenues of US$ 7.9 billion; this is equivalent to 1.7 percent of the global total, or 8.3 percent of that for Asia and the Pacific in 2002.

Table 2 Expected Tourism Revenue Change from 2002 Level

Countries/areas	Repeat of 2002 growth (US$ billions)	Iraq conflict, no SARS (US$ billions)	Iraq conflict & SARS outbreak (US$ billions)	SARS outbreak only (US$ billions)	SARS outbreak (% of GDP)
East Asia					
China	2.0	1.0	-4.0	-5.0	-0.4
Hong Kong	0.8	0.4	-2.3	-2.7	-1.7
South Korea	0.3	-0.1	-0.9	-0.8	-0.2
Taiwan	0.2	0.0	-1.2	-1.2	-0.4
Southeast Asia					
Indonesia	-0.1	-0.4	-0.9	-0.5	-0.2
Malaysia	0.3	-0.1	-1.8	-1.7	-1.7
Philippines	0.1	0.0	-0.2	-0.2	-0.3
Singapore	0.0	-0.2	-1.3	-1.1	-1.2
Thailand	0.6	0.2	-1.1	-1.3	-0.9
Vietnam	0.2	0.1	-0.2	-0.4	-1.0
Total	**4.3**	**1.0**	**-13.9**	**-14.9**	**-0.5**

Source: ADB. 2003. Oxford Economic Forecasting (OEF).

Table 3 Costs of SARS for East and Southeast Asian Economies in 2003 (percentage of GDP)

Countries/areas	Estimated loss of tourism revenue	OEF Model GDP loss	OEF Model total final expenditure loss
East Asia			
China	0.4	0.5	1.3
Hong Kong	1.7	2.9	7.6
South Korea	0.2	0.1	1.2
Taiwan	0.4	0.5	1.6
Southeast Asia			
Indonesia	0.2	0.1	0.9
Malaysia	1.7	0.4	2.9
Philippines	0.3	0.0	0.7
Singapore	1.2	3.0	9.0
Thailand	0.9	1.4	3.2
Vietnam	1.0	1.1	1.1
Total	**0.5**	**0.6**	**2.0**

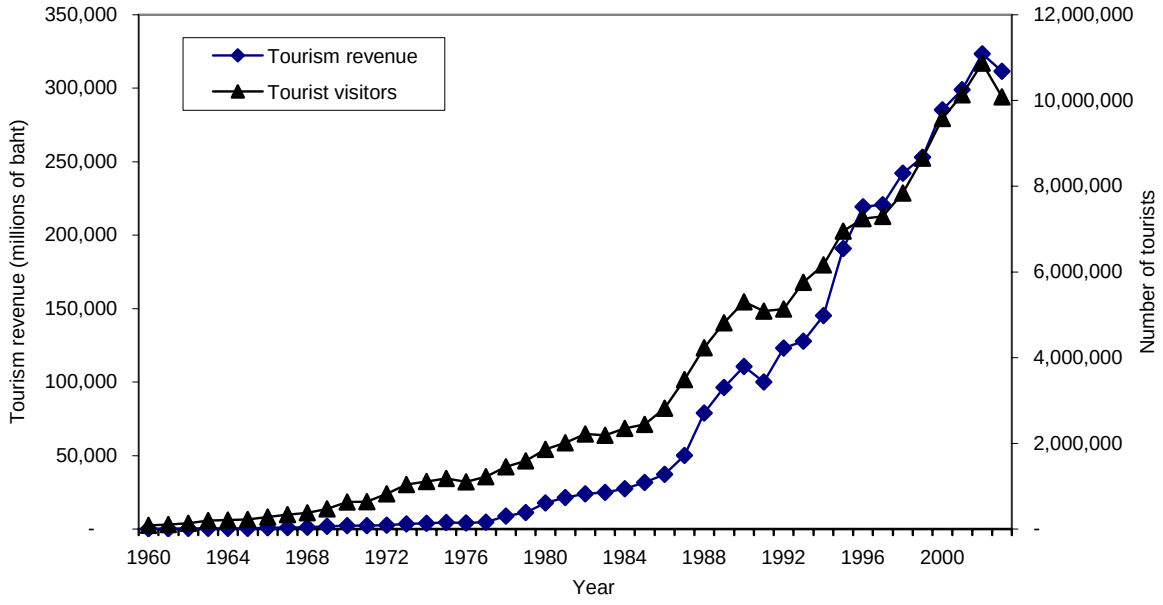
Source: ADB. 2003. Oxford Economic Forecasting (OEF).

In the last two decades, Thailand enjoyed increasing international tourism receipts, from 2.68 percent of GDP in 1980 to 5.93 percent in 2002. However, the GDP share decreased to 5.25 percent in 2003,[7] owing to the reduction of inbound tourists as a consequence of the SARS outbreak during the period from March to June 2003. Tourism income increased from 145 billion baht in 1994 to 312 billion baht in 2003. Tourism income increased with the diminishing growth rate: 12 percent before the 1997 Asian financial crisis (from 1994 to 1997); 9.0 percent during the period 1998-2002;[8] and the lowest level, 8.0 percent, was in the year 2003.

The number of tourists to Thailand increased from 81,340 in 1960 to 10.08 million in 2003 (Figure 1). However, Thailand experienced negative growth in tourist numbers in 1976, 1983, and 1991 when there were political conflicts within the country or in the region, and again in 2003 owing to the unexpected outbreak of disease. During the last decade, tourist arrivals in Thailand had been increasing, with the average growth rate being 4.81 percent, while the average growth rate for length of stay (–0.04%) and that for expenditures (0.29%) remained relatively unchanged (Table 4). The real expenditure in baht per person per day remained relatively unchanged in the last decade, while the dollar amount of daily spending by tourists dropped significantly (Apichart and Kiratipong 2003). Overseas tourists in Thailand made expenditures[9] for shopping (32%), accommodation (25%), dinning out (16%), entertainment (11%), local transport (7%), sightseeing (5%) and others (4%). Even if tourist arrivals increase but real tourism receipts diminish owing to a higher inflation rate, lower spending, or lower average length of stay in the destination, increasing income from tourism for Thailand would stem mainly from increasing the number of visitors; however, the average expenditure per person per day and length of stay have not changed much in the last decade.

The stability of tourism income indicates how well the tourism industry operates under conditions of influence by internal and external factors. Stability or variations in tourism receipts over time can be explained by changes in variables such as income, inflation rate and exchange rate differentials as well as political factors (Syriopoulos 1995). During the period 1960-1994, the stability of income from tourism was on par with the stability of that from the export of goods and services measured by the coefficient of variation (COV) regardless of the factors affecting the variation. The COV[10] of tourism income was 143.3 percent and that of exports 143.0 percent (Nipon 1995 cited in TDRI 1997). In the last two decades, the COV of tourism income was 75.2 percent and that of exports 89.1 percent. However, there is non-significant difference. The result indicates that, compared with their means, the export of goods and services varies slightly more than income from tourism, but without statistically significant difference (Figure 2).

Figure 1 Number of International Tourists and Revenue, Thailand, 1960-2003



Note: 1976, 1983, 1991 and 2003 = negative growth in tourist numbers.

Source: TAT, various issues.

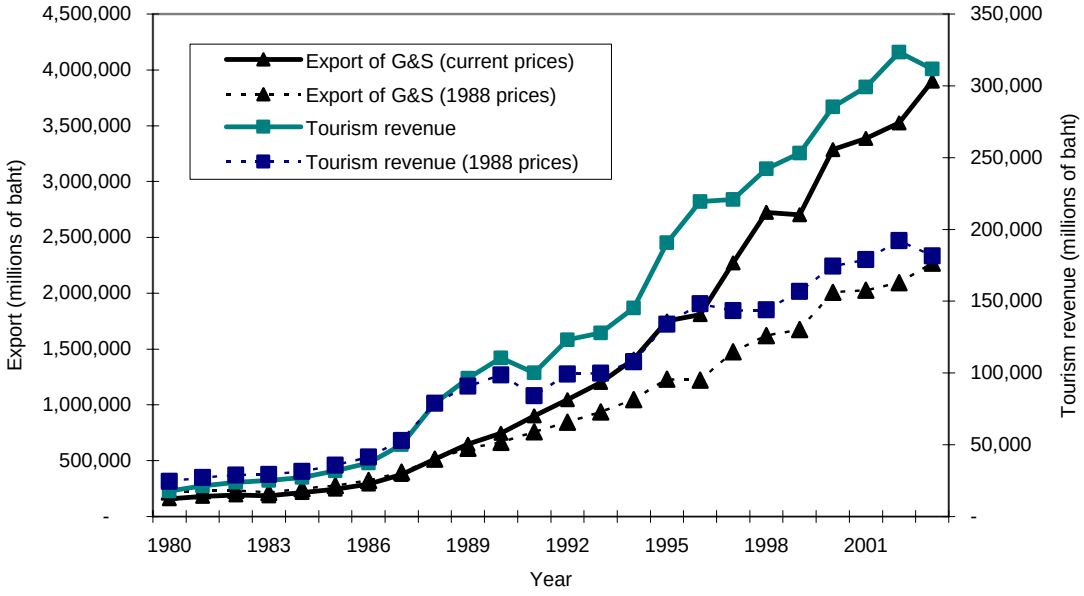
Table 4 International Tourist Arrivals and Receipts in Thailand, 1996 to 2005*

Year	Tourists		Average	Average expenditure		Revenue	
	Number (millions)	Change (%)	length of stay (days)	/person/day (baht)	change (%)	(millions of baht)	Change (%)
1996	7.19	3.46	8.23	3,706	0.34	219,364	14.99
1997	7.22	0.41	8.33	3,672	-0.92	220,754	0.63
1998	7.76	7.53	8.40	3,713	1.12	242,177	9.70
1999	8.58	10.50	7.96	3,705	-0.23	253,018	4.48
2000	9.51	10.82	7.77	3,861	4.23	285,272	12.75
2001	10.06	5.82	7.93	3,748	-2.93	299,047	4.83
2002	10.80	7.33	7.98	3,754	0.16	323,484	8.17
2003	10.00	-7.36	8.19	3,774	0.55	309,269	-4.39
2004	12.00	19.95	8.00	4,000	5.97	384,000	24.16
2005	13.38	11.50	8.10	4,150	3.75	450,000	17.19

Note: * 1996-2003—Actual; 2004-2005—Tourism Strategy of the Ministry of Tourism and Sports.

Source: http://www2.tat.or.th/stat/web/static_index.php (August 30, 2004).

Figure 2 Export of Goods and Services and Tourism Revenue, Thailand, 1980-2003



Source: TAT statistics and BOT statistics.

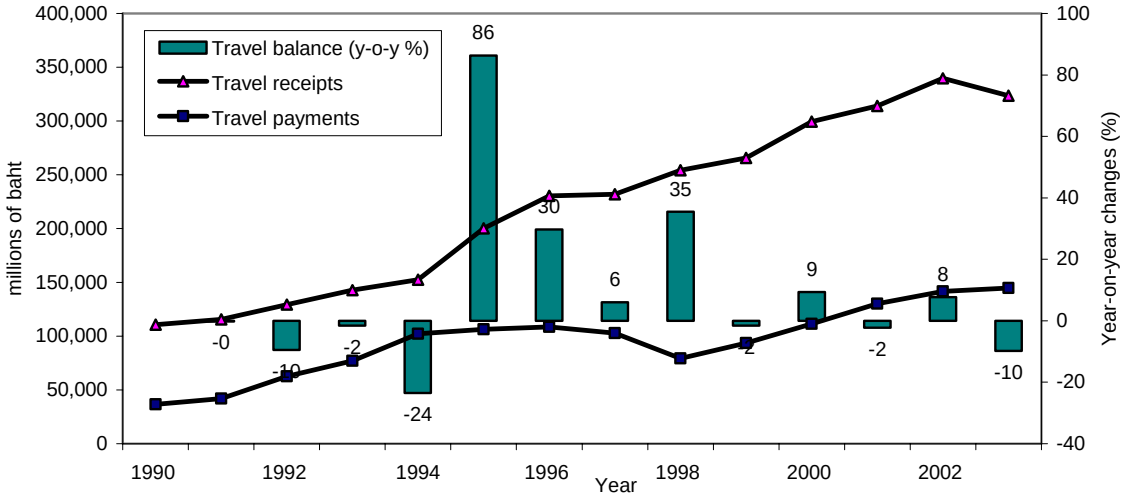
The travel account forms a significant part in the balance of payments account. With a positive travel balance,[11] Thailand experienced a diminishing growth rate before the 1997 Asian crisis. After the crisis, travel payments declined at the rate of –23 percent annually, while travel receipts increased by 10 percent; therefore, the growth rate of the travel balance became positive with some slowdown in 1999 and 2001. Owing to the SARS outbreak in 2003, tourism receipts declined at a faster rate than the drop in tourism payments; net service income registered a surplus of only 179 billion baht, compared with a surplus of 198 billion baht in 2002, or a decline of –10 percent (Figure 3).

ECONOMIC AND SOCIAL IMPACTS OF SARS OUTBREAK

Among the major factors affecting the stability of tourism income are unexpected events, such as wars, terrorism, conflicts and disease outbreaks, which might affect the security of tourists. Although WHO did not consider Thailand a SARS area, the outbreak had negative impacts on the Thai economy, particularly on the tourism industry. International tourist numbers declined by 30 to 40 percent during the outbreak period compared with the same period in the previous year (Figure 4), while total tourism revenue decreased by 5 percent.[12] NESDB (2003) estimated the loss of tourism

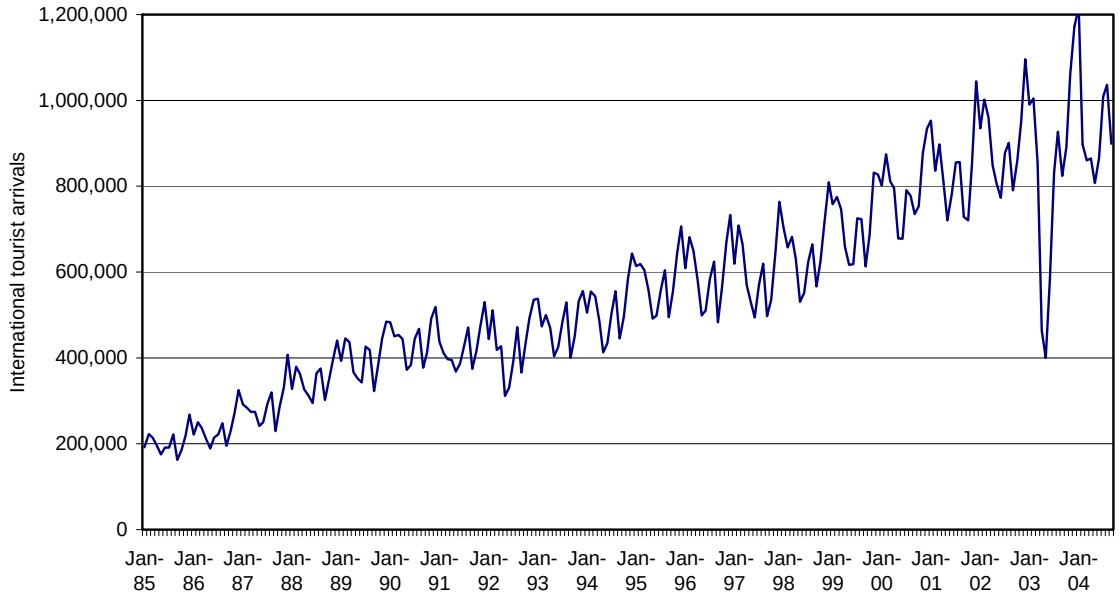
income to be about 31 billion baht, based on the fact that the number of foreign tourists dropped substantially, i.e., by 40.2 percent (975,709 people x 8 days x 4,000 baht/day). Additionally, Akarapong (2004) forecast the tourist arrivals and tourism, assuming no SARS outbreak. The methodology applied in forecasting tourist arrivals is the Seasonal AutoRegressive Integrated Moving Average (SARIMA) model. The number of tourists from March to June 2003 was forecast to be over 3.5 million, while the actual number reached only 2.3 million (Table 5).

Figure 3 Travel Receipts, Travel Payments, and Year-on-year Changes, Thailand, 1990-2003



Source: BOT statistics.

Figure 4 Monthly International Tourist Arrivals, Thailand, 1985-2004



Source: TAT data.

Table 5 Tourism Revenue Loss Estimates as a Result of the SARS Outbreak in Thailand, March to June 2003

Month	Predicted (number)	Actual (number)	Difference (number)	Percentage of the difference	Average of length of stay (days/visit)	Revenue loss estimates (million baht)
March	994,704	861,259	-133,445	-13.42	8.52	4,268
April	910,455	470,969	-439,486	-48.27	7.89	13,016
May	802,591	404,563	-398,028	-49.59	7.32	10,937
June	816,515	591,164	-225,351	-27.60	7.44	6,294
Total	**3,524,265**	**2,327,955**	**-1,196,310**	**-34.72[1]**	**7.79[1]**	**34,515**

Note: 1 = average.
Source: Akarapong 2004.

Scenarios

Reductions in international tourist arrivals meant not only a loss in tourism revenue, but also losses in other tourism-related businesses as well. Therefore, the CGE model[13] was used to estimate the economic and social impacts of SARS outbreak. The scenarios tested in this model are: a) with SARS outbreak, and b) without SARS outbreak. It is assumed that "without SARS outbreak" scenario will base on the forecast international tourist arrivals and tourism income for the period of March to June 2003 using SARIMA model.[14]

RESULTS AND DISCUSSION

Based on the forecast tourism arrivals by SARIMA model, assuming no SARS outbreak, the number of international tourists between March to June 2003 was forecast to be 35 percent higher than the actual tourist arrivals. The difference in tourist numbers was then converted to a tourism revenue loss of around 34.5 billion baht (Table 5). The results from the CGE model reveal that if SARS outbreak had not occurred, the tourism revenue will increase by 11.00 percent compared with the scenario "with SARS outbreak" (Table 6). The effects on different sectors were as follows: GDP service sector +0.52 percent; GDP industrial sector +0.34 percent and GDP agricultural sector +0.31 percent. The service balance was positive (24.33%) owing to the increase of tourism revenue, while the trade balance was negative (–10.92%). Moreover, some service sectors related to tourism activities would receive some gain; these included hotels (+2.55%); local transportation (+1.83%); restaurants (+1.22%) and entertainment (+0.60%). In terms of social impacts, households in all income ranges would have positive affect, if SARS outbreak had not occurred, more or less equally in relation to their initial income, with the range being +0.52 to +0.59 percent for farm households and +0.62 to +0.64 percent for non-farm households, with the average being +0.61 percent (Table 6).

Table 6 Estimation of Economic and Social Impacts with and without SARS Outbreak

ITEMS	Unit	Scenarios		Growth (%)
		with SARS	without SARS	
Tourism income	billion baht	314	349	11.00
GDP agriculture	billion baht	605	607	0.31
GDP industrial	billion baht	2,513	2,522	0.34
GDP service	billion baht	2,705	2,719	0.52
GDP	billion baht	5,823	5,848	0.42
Total export goods and services	billion baht	3,827	3,859	0.83
Total import goods and services	billion baht	3,564	3,577	0.37
Trade balance	billion baht	128	114	-10.92
Service balance	billion baht	135	167	24.33
Current account balance	billion baht	192	211	9.78
Household Income				
All households income	billion baht	3,732	3,755	0.61
Share of the richest group 20%	%	57.75	57.75	0.01
Share of the next richest group 20%	%	19.75	19.76	0.00
Share of the middle group 20%	%	11.39	11.39	-0.01
Share of the next poorest group 20%	%	7.20	7.19	-0.03
Share of the poorest group 20%	%	3.91	3.91	-0.03

Source: Macroeconomic Policy Program, TDRI estimation.

Like other unexpected events, the SARS outbreak proved to be a substantial factor negatively affecting international tourism in the short term. During the period from April to June 2003, the SARS outbreak disrupted short-term economic prospects; in August 2003 the rate of tourist arrivals started to return to normal. The social and economic impacts were not as costly as expected owing to the immediate measures implemented by the Thai government, as well as domestic tourism promotion. Nevertheless, tourism is a fragile industry, and is very susceptible to economic conditions, political instability as well as safety concerns; therefore, an early warning system for tourism security, and effective prevention measures are necessary to guarantee tourist safety because safety is the most crucial issue in this sector.

ENDNOTES

[1] TDRI (1997) applied dynamic forecasting models with "three simple structural equations," namely, foreign arrivals, length of stays in Thailand, and tourist expenditure.

[2] TDRI (2001) applied three single equations, namely, foreign arrivals, length of stays in Thailand, and tourist expenditures, concentrating on different markets.

[3] Management operating margin is equal to management earnings before other operating items divided by management revenues.

[4] The tourism sector accounts for over 9 percent of GDP in East Asia (China, Hong Kong, South Korea, and Taiwan) and about 11 percent in Southeast Asia (Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam).

[5] This estimate takes account of the direct economic effects of SARS (tourism and consumption loss) and the indirect impacts. The relationships within the model allow for the repercussions of consumer spending on investment, the export and import of goods, employment, and prices, on the assumption that a SARS epidemic does not recur, and tourism recovers by late 2003.

[6] Acharee (2004).

[7] Despite the impact of the SARS outbreak, GDP in 2003 ended up, with a growth rate of 6.7 percent owing to continued expansion of domestic demand, both private consumption and investment, and high export growth (NESDB 2003).

[8] In December 1997, the "Amazing Thailand" tourism promotion campaign was launched in Bangkok and internationally (17 offices overseas coordinated the launch of the campaign internationally). Amazing Thailand extended over two years, with cultural performances, handicraft displays, traditional dancing and processing throughout. Tourism promotion had a positive impact on the number of visitors (TDRI 1997; TDRI 2001).

[9] Average overseas tourism spending by category, 1994-2002 (calculated from TAT data).

[10] The coefficient of variation expresses the standard deviation as a percentage of mean value; this allows a comparison of the variability of different variables. The smaller COV indicates more stability.

[11] Travel covers primarily goods and services acquired by "travelers," either for personal consumption or for business, during their stay outside their country of residence for a period of less than one year. There is an exception for students and patients regardless of their duration of stay, military and embassy personnel, and workers. The balance of payments is a summary of the economic transactions between residents and non-residents that take place during a specific time period.

[12] Tourism revenue for 2003 was 10 percent less than the expected target (TAT 2004). After the SARS outbreak, TAT adjusted its target: tourist arrivals dropped from 11.13 million to 9.70 million, or a reduction of 10.15 percent; tourism revenue declined from 360.6 billion baht to 289.6 billion baht, or a reduction of 10.47 percent.

[13] The CGE model was created by using SAM 2001, which consists of 1,007 accounts, 79 production sectors, 20 households classified by income class, agriculture and non-agriculture, business corporation, government, household consumption, private investment, public expenditures, saving pools, tourism and the rest of the world (TDRI 2002). The CGE model was developed by the Macroeconomic Policy Program, Thailand Development Research Institute, 2004.

[14] Akarapong 2004.

REFERENCES

Acharee Sattarasart. 2004. Tourism income growth and stability. Paper presented at the Seminar on "Integrated Development of Sustainable Tourism in the Mekong Region," Friday 15th – Saturday 16th October 2004 at Anantara Resort & Spa Golden Triangle Chiang Saen, Chiang Rai, Thailand.

Akarapong Untong. 2004. The impact of the SARS outbreak on Thailand's tourism industry: A SARIMA model approach. Paper presented at the Seminar on

"Integrated Development of Sustainable Tourism in the Mekong Region," Friday 15th – Saturday 16th October 2004 at Anantara Resort & Spa Golden Triangle Chiang Saen, Chiang Rai, Thailand.

Apichat Pongsirirushakun, and Kiratipong Naewmalee. 2003. "An Analysis of Foreign Tourist Expenditure in Thailand." *TDRI Quarterly Review* 18 (2), June.

Asian Development Bank (ADB). 2003. *Assessing the Impact and Cost of SARS in Developing Asia*. Manila: ADB.

Bank of Thailand (BOT) data.

Fan, Emma Xiaoqin. 2003. *SARS: Economic Impacts and Implications*. Economics and Research Department Policy Brief series no. 15. Manila: Asian Development Bank.

Four Seasons Hotels. 2003. Annual Information Form. Bangkok.

Kim, Seongseop, Seungryung Nam, and Kihong Kim. 2004. News shock impact on inbound tourist demand: volatility in South Korea. In Second Asia-Pacific CHRIE (APacCHRIE) Conference & The Sixth Biennial Conference on Tourism in Asia. "Hospitality, Tourism & Foodservice Industry in Asia: Development, Marketing & Sustainability," Phuket, Thailand, May 27-29.

National Economic and Social Development Board (NESDB). 2003. *Thai Economic Performance in Q2 and Outlook for 2003*. Bangkok: NESDB.

Richards, Patsy. 2003. *Tourism*. Research Paper 03/73, 23 September. London: Economic Policy & Statistics, House of Commons Library.

Syriopoulos, Theodore C. 1995. "A Dynamic Model of Demand for Mediterranean Tourism." *International Review of Applied Economics* 9 (3): 318-36.

Thailand Development Research Institute (TDRI). 1997. *Master Plan for Tourism Industry*. Bangkok: TDRI.

_____. 2001. *A Study for the National Action Plan for the Tourism Industry*. Bangkok: TDRI.

_____. 2002. *Computable General Equilibrium Modeling*. Bangkok: TDRI.

Tourism Authority of Thailand (TAT). 2004. "International Tourism in Thailand 2003." *E-TAT Tourism Journal* (January-March). http://www2.tat.or.th/tat/e-journal/47jan-mar/index.html (July 5, 2004).

_____. 2004. "Tourism Authority of Thailand data." http://www2.tat.or.th/stat/web/static_index.php (August 30, 2004).

World Trade Organization (WTO). 2003a. "Fact and Figures." http://www.world-tourism.org

_____. 2003b. "Tourism Highlight Edition 2003." http://www.world-tourism.org

WTTC. 2003. "SARS Economic Impact." http://www.wttc.org/