

Assessing the Impact and Cost of SARS in Developing Asia

Introduction

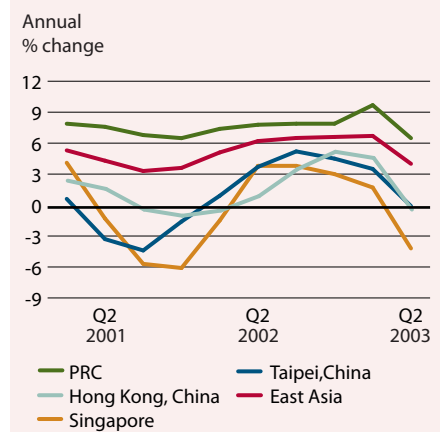
Irrespective of the actual cost of severe acute respiratory syndrome (SARS) from a health risk perspective, it is clear that the epidemic has inflicted much economic cost on East and Southeast Asia's economies.¹ As Figure 3.1 demonstrates, gross domestic product (GDP) weakened sharply in the second quarter across much of the region, co-incident with the SARS outbreak.

Even assuming that SARS is indeed over and that there are only very modest economic spillover effects remaining in the second half of 2003, analysis points to a total cost for the East and Southeast Asian economies as a whole of about US\$18 billion in nominal GDP terms for 2003, that is, about US\$2 million per person infected by SARS. However, the overall loss in demand and in business revenue, as measured by total final expenditure, is estimated at nearly US\$60 billion, showing that GDP losses would have been much higher had it not been for cuts in imports in SARS-affected economies. The scenario could easily have proved much worse had SARS been a more communicable disease, highlighting the potential scale of shocks emanating from serious, and increasingly global, health issues.

It is also noticeable that the economic costs imposed by even this relatively contained international health problem have been significant across a large part of Asia and not just in the countries in which SARS cases were actually reported. Tourism plummeted across the region. If the outbreak had been more prolonged, losses in export orders would have become a serious threat as well. Fortunately, most governments involved saw the need for determined action to bring SARS under control fast—and they were largely successful.

Whatever means are used to measure the economic costs, there can be no doubt about the large and immediate impact that news of SARS had on the public around the world (certainly the intense global media coverage ensured that news traveled fast). More puzzling, however, is that reactions among markets were probably much greater than most analysts would have envisaged had they been given information about SARS beforehand. The number of cases was actually quite small in a populous region (Table 3.1). It soon became apparent that outside a small, high-risk group, the spread of the disease was not very rapid and could be contained.

Figure 3.1 GDP Growth, East Asia



Source: Datastream.

Table 3.1 Number of SARS Cases Reported by the World Health Organization, 2003

	PRC	Hong Kong, China	Singapore	Taipei,China	Viet Nam	World
17 Mar	-	95	20	-	40	167
31 Mar	806	530	91	10	58	1,622
14 April	1,418	1,190	158	23	63	3,169
28 April	2,914	1,557	199	66	63	5,050
12 May	5,013	1,683	205	184	63	7,447
26 May	5,316	1,726	206	585	63	8,202
9 Jun	5,328	1,753	206	680	63	8,421
23 Jun	5,326	1,755	206	692	63	8,459
% Change from Two Weeks Earlier						
	PRC	Hong Kong, China	Singapore	Taipei,China	Viet Nam	World
31 Mar	-	458	355	-	45	871
14 April	76	125	74	130	9	95
28 April	106	31	26	187	0	59
12 May	72	8	3	179	0	47
26 May	6	3	0	218	0	10
9 Jun	0	2	0	16	0	3
23 Jun	0	0	0	2	0	0

Notes: The mortality rate of the SARS outbreak was 9.6% of cases. Hong Kong, China had the highest infection rate, at 0.026% of population. In comparison, the mortality rate of the 1918–19 influenza pandemic in the US was 2.5% of cases (with an infection rate of 28% of population). M. Billings. *The Influenza Pandemic of 1918*. Stanford University web site, available: <http://www.stanford.edu/group/virus/uda/>.

Source: Oxford Economic Forecasting.

Indeed, in Viet Nam, the outbreak was stabilized within 1 month, helped by prompt quarantining. Excepting Taipei,China, all economies had more or less stabilized cases by the beginning of May.

Why was the reaction to the news of SARS so serious? Most probably, this was initiated by uncertainty over the nature of the disease coupled with lack of confidence in the more optimistic prognoses that seemed untenable after data became available. Also perhaps the presentation and understanding of the data were poor, a problem that should be reviewed and addressed by governments and public health organizations. Out of all the risks being assessed in early 2003—geopolitical, economic, social—neither a global health scare nor a shock centered on East and Southeast Asia was uppermost in any analysis, perhaps another reason for SARS to create such a sharp impact.

SARS has highlighted just how damaging an unexpected, and seemingly uncontrolled, international health threat may be in today's global economy. If SARS had been a much more contagious disease (such as influenza), then the number of cases would have risen rapidly and significantly in many countries. The spread of the economic impact would also have been very rapid and much higher. SARS was (fortunately) more amenable to being brought under control largely because it was not easily spread. Contagion rates are clearly a critical part of any health-risk assess-

Box 3.1 Chronology of World Health Organization Travel Advisory Notices

2 April	Travel advisory on Hong Kong, China and Guangdong: “consider postponing all but essential travel”
23 April	Travel advisory extended to Beijing, Shanxi, and Toronto
28 April	Viet Nam removed from list of affected countries
29 April	Travel advisory on Toronto lifted
8 May	Travel advisory extended to Tianjin, Inner Mongolia, and Taipei
21 May	Travel advisory extended to all of Taipei, China
23 May	Travel advisory on Hong Kong, China and Guangdong lifted
30 May	Singapore removed from list of areas with local transmission of SARS
13 June	Travel advisory on Inner Mongolia, Shanxi, and Tianjin lifted
17 June	Travel advisory on Taipei, China lifted
23 June	Hong Kong, China removed from list of areas with local transmission
24 June	Travel advisory on Beijing lifted; Beijing removed from list of areas with local transmission
5 July	Taipei, China removed from list of areas with local transmission

ment: rapid and accurate information is essential in this context (Box 3.1). Government responses to SARS were also fairly rapid and pronounced, mitigating the damage—but almost certainly these responses would have proved insufficient had SARS been highly contagious.

Even though it was soon obvious that SARS was not as contagious and dangerous compared to the 1918–19 influenza pandemic, panic that it might turn out to be, led to a rapid buildup of fear. This was sufficient to cause economic dislocation and losses running into billions of dollars. The realization of the enormous scale of such threats is already encouraging policy makers to review the costs of eliminating, or at least reducing, some of the known root causes of such disease outbreaks, including weaknesses in public health and safety systems. Such costs may be low in comparison with the potential cumulative economic losses attributable to serious health scares.

In the following section, the general mechanisms by which the effects of events, such as SARS, are transmitted into the economies concerned are reviewed. The reasons why differential impacts were to be expected across the affected economies are examined next. In the following section, the economic losses attributable to SARS are assessed using the Oxford Economic Forecasting model. Finally, some conclusions and policy implications are presented.

Channels of Transmission of the SARS Shock

Public health risks such as SARS create an economic shock through a number of channels of transmission. The most important channel is through the dampening of tourism and of consumer confidence. They fall rapidly as news breaks, cutting services exports and consumer spending, which, in turn, creates secondary effects on the local economy. These sec-

ondary effects include employment loss, lowered investment, and reduced import demand. The impact spreads to other countries even without any direct connection to the initial driving factor—in this case, SARS—via the impact on confidence and reduced import demand.

Sentiment is a fickle variable, especially for tourism. Tourists can rapidly switch destinations or cancel trips reacting to news, and recovering confidence can be a difficult task. Consumers can only switch behavior on a smaller scale and less rapidly, as some purchases are essential, such as basic foods and supplies, while others are autonomous, such as rents (Table 3.2). However, the consumer can quickly cut back on nonessential items, such as leisure activities, and, for a time, may even cut spending on essential items if there is a temporary high-risk alert. A more serious and prolonged threat would not only reinforce existing apprehension but impact other sectors as well, such as exports and investment.

A chain of effects may be discerned for events such as SARS as follows:

- Inflows of foreign tourists to an affected country will fall sharply, and the average spending may also decline if stays are shorter and high-spending visitors stay away. But outbound (and local) tourism will also be affected both by concerns over travel and general retrenchment on the part of local consumers. This means cuts on both sides of the balance-of-payments services account and more losses in travel-related jobs. In addition, restrictions on travel and movement of people may be applied—possibly including quarantining—and this implies further losses in spending and tourism.

Table 3.2 Breakdown of Consumer Spending, Selected Economies, 2001

	PRC	Korea, Rep. of	Taipei,China	Thailand	United States
Food	28.1	14.6	20.9	25.1	7.1
Alcohol & tobacco	3.9	2.3	3.7	6.6	2.1
Clothing & footwear	10.1	3.9	4.1	11.0	5.1
Rent, water, fuel & power	10.3	17.5	18.3	9.2	17.2
Household goods & services	8.3	4.4	5.8	6.9	5.0
Health Expenditure	6.5	7.6	8.9	7.1	17.1
Recreation, education, & culture	13.0	13.0	19.2	8.1	11.5
Transport & communications	8.6	16.7	11.9	16.2	13.2
Other goods & services	11.3	20.0	7.2	9.7	21.7
Total Private Consumption	100.0	100.0	100.0	100.0	100.0

Sources: Statistical Yearbook of the Republic of China (web site); China Statistical Yearbook; Republic of Korea National Accounts (www.bok.or.kr); Thailand Annual National Accounts (www.nesdb.go.th); OECD National Accounts.

- Consumers will curb shopping trips and, especially, visits to restaurants and other leisure activities that are seen as both high risk and nonessential—and the perceived threat to jobs and incomes will add to local consumer caution.
- Government spending probably increases, linked to efforts to control the problem, and spending may be boosted further by fiscal packages to help those businesses most affected through, for example, tax breaks.
- Export orders and delivery will be hampered—by reduced numbers of visitors at trade fairs and cancellation of such fairs and conventions, reduced overall business travel, and general disruption to transport, affecting goods shipments as well as movements of people. This will create further repercussions on import demand as well.
- Business confidence and investment prospects will deteriorate, but this very much depends on the expected duration of the problem: if it is seen as a repeated threat, the consequences will be much more serious than if it is seen as a short-lived temporary phenomenon. Lower investment rates will impinge on growth in the capital stock.
- In fairly extreme cases, working days and production could be lost due to sickness, restrictions, and fear of contact—implying another round of effects on businesses and consumers caused by both the direct implications for trade and incomes and the fact that work time losses would reflect an escalation in the serious nature of the event, further eroding confidence.

The above channels will impact GDP growth. The following effects are also expected:

- Some prices would be boosted in the short run by supply problems (e.g., fresh food products) while others (e.g., hotel prices) would fall on plummeting demand.
- A deteriorating economic outlook, especially if coupled with longer-term concerns about repeated disease outbreaks and their consequences, would probably weaken financial markets and investment-linked capital inflows.

By the time SARS was brought under control in June, the impact of the outbreak had only reached the first three channels above (tourism, consumption, and government spending, though secondary effects will have influenced other variables as well). This should limit both the scale and the duration of the SARS effect in 2003. However, there are still some doubts about the other channels of contagion (exports and investment) given the longer time lags involved in such reactions and the lack of definitive data at this point. However, it can probably be safely assumed that any impacts on other channels will be less significant because of the fairly rapid rebound already being seen in the worst affected variables, i.e., tourism and retail sales. The direct SARS effect on working time and output has been negligible and specific SARS-related changes in other secondary variables (such as financial conditions and overall inflationary patterns) have been, and will remain, small and temporary (with some exception in the case of Hong Kong, China's inflation rate, where an existing, serious deflation problem has become worse).

Why Would SARS Impact Some Countries More than Others?

Several factors explain why some economies were more vulnerable and susceptible to the effect of SARS than others. These include:

- structural issues, such as the relative shares of tourism and consumption in GDP and the composition of consumer spending;
- initial conditions (consumer sentiment susceptibility); and
- government spending responses.

Economic Structures

Tourism and Services. Table 3.3 shows the relative importance of foreign tourism in 12 Asian economies (though the figures do not include local tourism and thus underestimate the importance of the tourism sector). Noticeably, East Asia is far less tourism dependent than Southeast Asia—with Hong Kong, China a significant exception, which added substantially to the impact of SARS on that economy.

While SARS reduced foreign tourist inflows, local residents also cut their travel and tourism abroad and thus *net* tourism receipts may be less affected, or even affected positively. The historic data for net tourism in Table 3.3 show a rather different vulnerability per country than the gross tourist receipts alone. Indeed, if effects on outbound and inbound tourism were symmetric, then economies such as the Republic of Korea (Korea); Taipei, China; and even Hong Kong, China may appear to be net beneficiaries of a tourism slump. This is, of course, not the case as losses in tourism spending, jobs, and investment would probably still be registered because local consumers would not switch all their cut in foreign spending into local services and goods, that is, the “substitution” would not be one

Table 3.3 Tourism Exports, 2001

	“Gross” US\$ million	% of GDP	“Net” US\$ million	% of GDP
East Asia				
PRC	17,792	1.5	3,883	0.3
Hong Kong, China ^a	7,930	4.8	-4,572	-2.8
Korea, Rep. of	6,292	1.5	-1,293	-0.3
Taipei, China ^b	4,229	1.5	-2,727	-1.0
Southeast Asia				
Cambodia	149	4.4	114	3.3
Indonesia	5,276	3.6	1,870	1.3
Lao PDR	104	5.9		
Malaysia	6,863	7.8	4,249	4.8
Philippines ^a	1,723	2.4	499	0.7
Singapore	5,111	6.0	-70	-0.1
Thailand	7,075	6.1	4,151	3.6
Viet Nam ^b	1,482	4.3		

^a 2000. ^b 2002.

Note: “Gross” tourism exports = business and personal travel credits; “Net” tourism exports = travel credits less travel debits.

Sources: Data from IMF *Balance of Payments Yearbook*; Central Bank of China.

for one. So from the business point of view, many companies would still register SARS-related losses. This measurement problem also exposes a serious weakness in using GDP to indicate “losses” as this is based on net trade. In many cases, it may be true that businesses have suffered heavy losses due to reduced total demand for domestic products, despite relatively lower reductions in net exports. A more appropriate measure of overall economic costs may thus be total final expenditure on domestic goods (taken here to be the sum of domestic demand plus exports). This indicator may be more relevant in evaluating the impact of SARS on business. This issue will be reviewed later in the presentation of the full estimates of SARS losses.

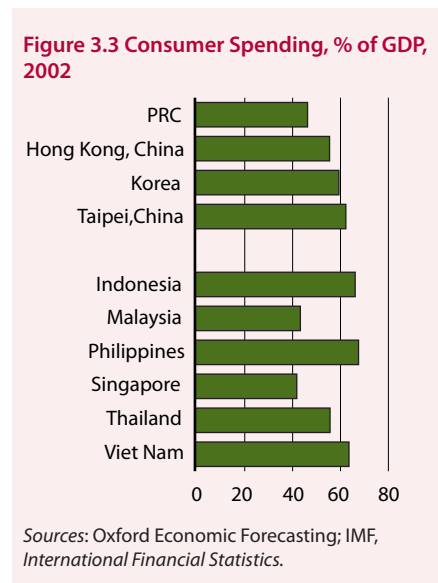
SARS also affected other services sectors, such as transport services. Figure 3.2 reports the importance of trade in services in some Asian economies. It highlights the importance of services in economies such as Hong Kong, China and Singapore. This may have led to greater vulnerability to SARS in these economies. The data in Table 3.3 and Figure 3.2 also show that the economies with larger shares of the tourism sector do not necessarily have a higher GDP share of the services export sector. This indicates that analysis focusing on the tourism sector alone may not be sufficient in analyzing the impact of SARS.

Consumption Patterns. In addition to tourism effects, local consumer confidence was influenced by the SARS scare. However, the evidence seems to point to a rather subdued SARS effect, with little or no sign of losses that can be attributed to SARS in some economies. While it seemed that bars, restaurants, and other leisure industry outlets were hard hit due to local spending cuts as well as tourism losses—and this news was widely covered in the press—total consumption data point to only a small overall impact. This may suggest that consumers did not translate the implied sentiment problem into significant spending cuts. Furthermore, in large economies SARS was relatively confined in terms of its geographical spread. In the PRC, for example, the major affected areas were only Guangdong province and Beijing. The impact on consumption would surely have been more severe had SARS been more widespread.

The impact of SARS on GDP is dependent on the overall importance of consumption in the economy. Consumer spending is a fairly low share of GDP in the PRC (47%). If consumption is a high proportion of GDP, then this exacerbates the impact on GDP of consumer cutbacks: Hong Kong, China and Taipei,China are much more sensitive than the PRC in this respect (Figure 3.3).

Initial Conditions

The global economy had been weathering other negative factors in the first half of 2003, such as the conflict in Iraq and its possible effects, as well as the overall weakness in some economies and job markets. In Asia, sentiment was dampened by regional terrorism, especially after the October 2002 Bali bombings. Thus, susceptibility to any shock was probably high in the first half of 2003. The initial economic conditions were very unfavorable in certain cases because of weakening consumption growth from late 2002—for example, Hong Kong, China; Singapore; and Taipei,China. In contrast, the PRC’s economy started out 2003 robustly, supported



mainly by strong investment and exports. In spite of being hard hit by SARS in April and May, consumption seemed to be recovering well in June. Consumption and the wider economy have also been only slightly damaged in Thailand where no SARS cases were reported but the large tourism sector still suffered from the threat of SARS in the second quarter. Strong economic momentum and consumer and investor confidence before SARS helped take Thailand over this hurdle, along with efforts on the part of the Government and businesses to reassure both visitors and residents.

Thus, looking at the quarterly growth rates, the impact of SARS would appear greater in those economies that were already weak, such as Hong Kong, China; Singapore; and Taipei, China, rather than those with strong growth momentum, such as the PRC and Thailand.

Recent statistics in the PRC; Singapore; and Taipei, China point to a deterioration in consumption of about 1 to 2 percentage points in the second quarter versus the first quarter of 2003. Thailand was similarly affected, due to tourism losses and sentiment problems rather than actual SARS cases. In Hong Kong, China, given the weaker base-year figure for the first quarter, the SARS impact on consumption can also be crudely estimated at about 2 percentage points. But even economies that had neither SARS cases nor significant tourism effects, such as Korea, recorded a poor first half performance in 2003 year on year. Indeed, Korea's figures look remarkably similar to those for Singapore and Taipei, China. This is not mainly due to SARS, though. Korean consumers, after rapid credit-fueled spending in recent years, turned cautious for a variety of domestic reasons, including a sharp drop in credit availability and an impending crisis over the nuclear policy of the Democratic People's Republic of Korea. SARS in neighboring economies may have exacerbated these negative impacts on consumer sentiment in these economies. Indeed, part of the explanation for the weakness in consumption in Hong Kong, China; Singapore; and Taipei, China is also related to ongoing concerns over weak economic growth and rising unemployment, not SARS in itself.

This analysis highlights the importance of disentangling the impact of SARS from the various other factors at work in the first half of 2003, including the conflict in Iraq, high oil prices, and other regional geopolitical issues.

Government Spending Responses

SARS prompted governments in Asia to implement medical and public health measures to prevent and control the spread of the disease. Moreover, many fiscal policy packages have been implemented to stimulate economies.

It is often difficult to mobilize a rapid and effective response through fiscal policy, though modest changes can be made to offer tax offsets and aid to particularly hard hit sectors (in the case of SARS, tourism and retailing businesses). Due to the time lags involved, the impact of fiscal measures may appear not at the same time as the event, but with a delay of perhaps a few months.

Box 3.2 illustrates the reported economic responses of five governments affected by the SARS crisis. On the whole they show a relatively cautious response with most of the increased spending being used to

Box 3.2 Government Economic Measures after the SARS Outbreak**People's Republic of China**

- April/May Price control/monitoring of SARS-related drugs and goods.
 May Temporary reductions/waivers of taxes and administrative fees for SARS-affected industries, including catering and hotels.
 Free medical treatment to farmers and poor urban residents who contracted SARS.
 Subsidies and temporary exemptions from personal income tax to medical staff treating SARS patients.
 Interest subsidies for air transport and tourism sectors.

Hong Kong, China

- 23 April 2003 The authorities announced a HK\$11.8 billion (US\$1.5 billion) economic relief package, representing 1% of Hong Kong, China's GDP. The package included the following measures for a limited period:
- temporary reductions/waivers of taxes and administrative fees;
 - a job creation scheme; and
 - a loan guarantee scheme.

Taipei, China

- April/May The authorities announced spending of NT\$50 billion (US\$1.4 billion) to help meet medical costs and business losses related to the SARS outbreak.

Singapore

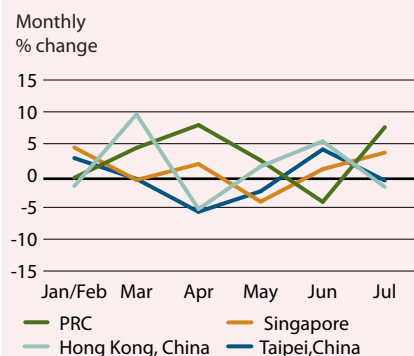
- 17 April 2003 The Government decided to implement a S\$230 million (US\$132 million) SARS relief package, including:
- temporary reduction/waiver of various administrative fees for tourism and transport sectors; and
 - relief measures for airlines.

Malaysia

- 21 May 2003 The Government announced a RM7.3 billion (US\$1.92 billion or 2% of GDP) economic package aimed to assist sectors significantly affected by SARS. Funded from the federal budget and contributions from Bank Negara Malaysia and other financial institutions, the economic package included:
- a reduction of Bank Negara Malaysia intervention rates by 50 basis points for cheaper loans;
 - foreign investment guidelines to be more investor-friendly;
 - support for tourism-related industries;
 - promotion of microcredit schemes and cheaper housing loans; and
 - support for job training.

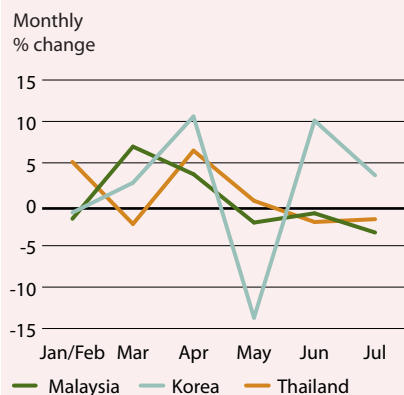
compensate tourism-related industries for the losses incurred by SARS. However, Malaysia's package was more ambitious in the sense that it included measures for the wider economy, although this was adopted rather late in the second quarter. In the PRC, the monthly data suggest

Figure 3.4 Seasonally Adjusted Exports, Selected Economies, 2003



Source: Generated from Datastream's seasonal adjustment package.

Figure 3.5 Seasonally Adjusted Exports, Selected Economies, 2003



Source: Generated from Datastream's seasonal adjustment package.

that the pace of investment growth by the Government was stepped up during the second quarter of 2003. The impact of fiscal stimulus is likely to be more apparent in the second half of the year

Recent Data and Forecasts: A Pre- and Post-SARS Comparison

Recent Statistical Releases

Recent statistical releases and a comparison of pre- and post-SARS conditions shed some light on the impact of SARS. A number of developments can be spotted from recent statistical releases. SARS-affected economies experienced drops in retail sales growth in the order of 5–10%, with a sharp, but not complete, bounce back in June. Countries such as Thailand, dependent on tourism but free from a SARS outbreak, experienced a similar profile, though to a much more modest extent.

Data on merchandise exports provide few indications of any decisive change in trend at the onset of SARS (Figures 3.4 and 3.5). In the short term, the PRC's export performance appears to have been barely dented, while the exports of the non-SARS economies also show little sign of deteriorating from the early 2003 trends. For Hong Kong, China; Singapore; and Taipei, China the data are more suggestive of a small impact on exports in April–May, that had ended by June.

Recent data confirm the impact of SARS on tourism. April tourist arrivals collapsed by between 20–70% for the economies hit by SARS, while the other economies in the region saw declines of 15–35% (Figures 3.6 and 3.7). The month of May saw a further deterioration in tourism across the region, with a particularly severe drop in Taipei, China. But with the outbreak coming under control, June's arrivals data showed smaller declines, notably in Hong Kong, China and in Singapore. This pattern was broadly repeated in the retail sales figures.

Because data on tourist arrivals are more rapidly available than tourism receipts, the trends established can be used as a guide to the short-term performance of the tourist sector as a whole. That is, these data can be taken as a reasonable proxy for likely swings in US dollar tourism receipts in the second quarter of 2003, largely representing the impact of SARS. Table 3.4 shows rough estimates of the costs to the region's foreign tourism industries of the SARS outbreak. This is done by linking the monthly profile of arrivals so far this year to tourism receipts from previous years. With the SARS outbreak apparently over by June, it is assumed that the year-on-year change in arrivals will smoothly return to zero by the end of the year (Figure 3.8). Using this "rule of thumb", we can determine the change in tourist arrivals for 2003 as a whole and work out approximate figures for the lost revenue relative to 2002's outcome. The estimating method is relatively simple, but nevertheless provides some crude indications of the cost of SARS on tourism.

It is assumed that other factors, such as the conflict in Iraq, would have led to a 5% drop in the growth rates of tourist arrivals during 2003 as a whole. As Table 3.5 indicates, this loss alone might still have permitted a small increase in East and Southeast Asia's tourism revenue relative to 2002. Comparing this figure with the prospective revenue loss, including SARS, provides an estimate for the cost of SARS itself. For East and Southeast Asia as a whole, this amounts to nearly \$15 billion or 0.5%

Table 3.4 Costs of SARS for Foreign Tourism

Assuming:	Forecast Growth of Visitor Arrivals (%)	Estimated Change in Tourism Revenues Relative to 2002 (US\$ billion)
PRC		
Repeat of 2002 growth	10.0	2.0
Iraq conflict effects but no SARS	5.0	1.0
Continuance of SARS (May extrapolation)	-22.9	-7.7
End to SARS in June (August assumption)	-9.6	-4.0
Singapore		
Repeat of 2002 growth	0.6	0.0
Iraq conflict effects but no SARS	-4.4	-0.2
Continuance of SARS (May extrapolation)	-53.6	-2.8
End to SARS in June (August assumption)	-25.6	-1.3

Source: Oxford Economic Forecasting.

of GDP. This is a weighted average and reflects the fact that tourism is a relatively small part of the PRC economy; the scale of the losses in the more tourism-dependent economies are much greater as a share of GDP, exceeding 1% in Hong Kong, China; Malaysia; Singapore; and Viet Nam.

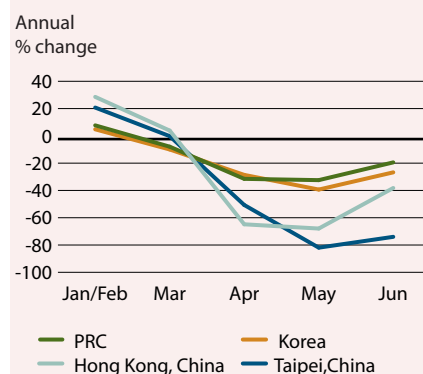
These estimates of the costs of SARS focus on lost foreign tourism receipts only and so show only a part of the overall picture. However, they provide a useful starting point in predicting the scale of likely business losses. A more comprehensive analysis of the economic costs of SARS will not only need to assess the impact on other parts of the services account but also the direct impact on consumer spending and the indirect repercussions of the shock on trade and investment (which are discussed later).

Overall, the latest evidence tends to support the view that the main channels of the SARS economic impact were tourism and related service industries, such as air travel. Consumption and other variables were caught up in the backwash; they did not play a lead role in initiating the disturbance to the economies affected.

Pre- and Post-SARS Economic Forecasts

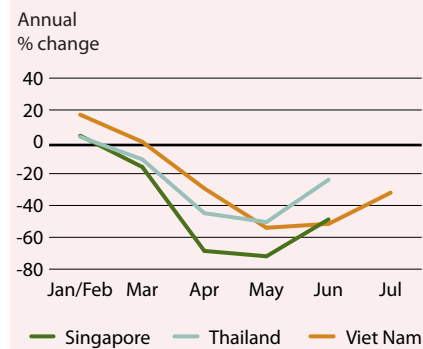
Table 3.6 gives the changes to GDP growth and inflation forecasts over the last 10 months and gives an idea of the possible impact of SARS. So perhaps these changes could be taken as crude estimates of SARS-related losses? In short, no. The changes seen in the forecasts also take account of a number of other factors independent of SARS, such as the conflict in Iraq, the PRC's much stronger than expected economic start to 2003, changing perceptions about the speed of the US recovery, and the unexpected collapse of Korean consumer spending. In the case of the PRC, the ADB forecast for 2003 growth is now higher than it was pre-SARS—the

Figure 3.6 Visitor Arrivals, East Asia, 2003



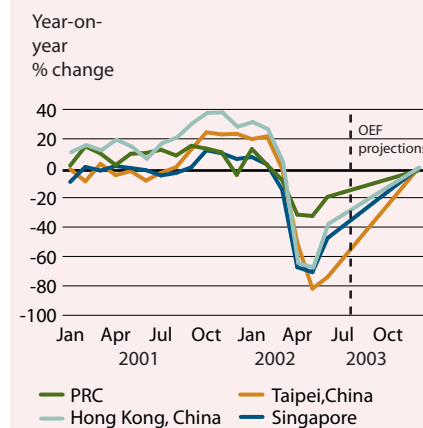
Source: Oxford Economic Forecasting.

Figure 3.7 Visitor Arrivals, Southeast Asia, 2003



Source: Oxford Economic Forecasting.

Figure 3.8 Tourist Arrivals, East Asia and Singapore



Source: Oxford Economic Forecasting.

Table 3.5 Expected Tourism Revenue Change from 2002 Level (US\$ billion)

Assuming:	Repeat of 2002 Growth	Iraq Conflict, no SARS	Iraq Conflict and SARS Outbreak	SARS Outbreak Only	SARS Outbreak (% of GDP)
PRC	2.0	1.0	-4.0	-5.0	-0.4
Hong Kong, China	0.8	0.4	-2.3	-2.7	-1.7
Korea	0.3	-0.1	-0.9	-0.8	-0.2
Taipei, China	0.2	0.0	-1.2	-1.2	-0.4
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
Viet Nam	0.2	0.1	-0.2	-0.4	-1.0
Total	4.3	1.0	-13.9	-14.9	-0.5

Note: The first three data columns indicate the change in tourism revenue from the 2002 level under three different scenarios. First, if tourism had grown as fast in 2003 as in 2002; second, an estimate of the increase in tourism revenue assuming the effects of the conflict in Iraq but no SARS; and third, an estimate of the increase in tourism revenue assuming both the effects of the conflict in Iraq and SARS. The difference between the first two data columns gives an indication of the costs for Asian tourism of the Iraq conflict, while the difference between the second and third data columns gives an indication of the impact of the SARS outbreak (shown in data column four).

Source: Oxford Economic Forecasting.

undoubted costs of the outbreak were offset by the unforeseen strength in GDP growth in the first quarter. In contrast, in the case of Singapore, the fall in the 2003 ADB forecast to 0.5% from 4.0% reflects not only the impact of SARS but also heightened concerns over domestic structural issues and some disappointment with the pace of US recovery.

Isolating the SARS Losses

In the context of unexpected shocks like SARS, a global macroeconomic model provides valuable technical information that can help analysts distinguish between those variable changes that were predicted by the usual explanatory factors versus those changes that remained unexplained. With data now available, we can compare the “unexplained” changes in key economic variables between the first and second quarters of 2003 in order to identify the SARS impact in the second quarter and, by effectively reversing this impact, we can then run a counterfactual simulation on the Oxford Economic Forecasting model to estimate what GDP growth, consumer spending, and other variables might have been if the SARS epidemic had not occurred. The difference between this counterfactual and the model’s current set of forecasts provides an estimate of the total cost of SARS to the East and Southeast Asian economies in terms of overall GDP losses. This estimate takes account of not just the direct economic effects of SARS, such as the tourism and consumption losses, but also the indirect impacts. For example, the relationships within the model allow for the repercussions of consumer spending on investment, exports, and

Table 3.6 Changes to GDP and Inflation Forecasts

	2003 GDP Growth		2003 CPI Inflation
	Official	ADB	ADB
PRC			
Pre-SARS	7.0	7.2	0.5
Mid-SARS		7.3	0.5
Post-SARS		7.8	1.0
Hong Kong, China			
Pre-SARS	3.0	2.8	-2.7
Mid-SARS		2.0	-1.5
Post-SARS	2.0	2.1	-2.8
Taipei, China			
Pre-SARS	3.7	3.5	0.3
Mid-SARS		3.7	0.4
Post-SARS	3.1	3.1	-0.1
Singapore			
Pre-SARS	2.0–5.0	4.0	0.1
Mid-SARS		2.3	0.5
Post-SARS	0.0–1.0	0.5	0.4
Korea			
Pre-SARS	5.0	5.5	3.1
Mid-SARS		4.0	4.0
Post-SARS	3.5	3.1	3.4
Thailand			
Pre-SARS	4.0–5.0	4.3	0.7
Mid-SARS		5.0	1.3
Post-SARS	4.0–5.0	5.2	1.3
Malaysia			
Pre-SARS	6.0–6.5	5.0	2.5
Mid-SARS		4.3	1.9
Post-SARS	4.5	4.1	1.3

CPI = consumer price index.

Sources: Official forecasts are from government sources. For ADB, pre-SARS forecasts are ADB's forecasts from ADO database, December 2002; mid-SARS forecasts are ADB's forecasts from April 2003 (ADO 2003); post-SARS forecasts are ADB's forecasts from September 2003 (ADU 2003).

imports of goods, employment, and prices. On the assumption that a SARS epidemic does not recur, and tourism recovers by late 2003, losses will largely be confined to 2003.

The results are tabulated in Tables 3.7 and 3.8. The total GDP losses (in US\$ billion) estimated by the “model scenario” method are typically larger than the losses indicated in the previous analysis of the likely impact of SARS on tourism receipts. However, for a few economies, this may not be the case as the tourism analysis was only looking at the effect on the inflows of tourist receipts, not taking account of the net position after allowing for cuts in tourism outflows and other imports. Cuts in imports of services (and goods) are allowed for in the final model estimates. Indeed, lower than expected imports have been an important factor in the second quarter GDP data being generally better than many anticipated.

Table 3.7 Costs of SARS for East and Southeast Asian Economies in 2003^a

	Consumer Spending		GDP		TFE	
	\$ billion	% of GDP	\$ billion	% of GDP	\$ billion	% of GDP
PRC	4.2	0.3	6.1	0.5	17.9	1.3
Hong Kong, China	3.4	2.2	4.6	2.9	12.0	7.6
Korea	0.1	0.0	0.3	0.1	6.1	1.2
Taipei,China	1.8	0.6	1.3	0.5	4.6	1.6
Indonesia ^b			0.3	0.1	1.9	0.9
Malaysia ^b			0.4	0.4	3.0	2.9
Philippines ^b			0.0	0.0	0.6	0.7
Singapore	0.6	0.7	2.7	3.0	8.0	9.0
Thailand	1.0	0.7	1.9	1.4	4.5	3.2
Viet Nam ^b			0.4	1.1	0.4	1.1
Total			18.0	0.6	59.0	2.0

GDP = gross domestic product; TFE = total final expenditure (sum of domestic demand plus exports).

^a Calculated using the Oxford Economic Forecasting model (technical model estimates based on Q2 data).

^b No figure for consumer spending is given as no significant change could be attributed to SARS in the second quarter.

Source: Oxford Economic Forecasting.

The overall loss in total final expenditure is also estimated. This may be a more appropriate way of looking at the cost of SARS and total business losses. The losses in total final expenditure terms correspond more closely to many of the initial SARS impact estimates. As mentioned earlier, this may be a better indicator for reflecting the impact of SARS on business.

The analysis reveals that SARS has caused significant losses in several Asian economies, although it has not proved as catastrophic as some feared back at the height of the outbreak in April. The result points to the cost of SARS in terms of lost GDP in nominal terms as being about US\$18 billion for developing Asia as a whole, a loss of about 0.6 percentage points for 2003's growth rate for the region. The total final expenditure cost is likely to be close to US\$60 billion, about 2 percentage points of GDP. Losses could be put higher still if SARS has created a long-tail problem for investment and exports prospects. These economic costs are very high compared to the actual scale of the disease—representing about US\$2 million per person infected based on the GDP estimate, and US\$6 million using the total final expenditure estimate. Had the disease lasted two quarters instead of one, with continuing impacts into late 2003 and early 2004, the losses could easily have been two or three times the figures quoted.

The outcomes reflect the scale of each factor in the economy concerned. For the two economies of Hong Kong, China, and Singapore, large losses in services exports are of much greater consequence than a similar percentage loss in services exports for PRC; Korea; or Taipei,China. In addition, the consumer impact on Hong Kong, China was clearly much greater than that seen elsewhere, although the second quarter results for

Table 3.8 Summary Costs of SARS for East and Southeast Asian Economies in 2003 (% of GDP)

	Estimated Loss of Tourism Revenue	Change in ADB 2003 GDP Forecast ^a	OEF Model GDP Loss	OEF Model TFE Loss
PRC	0.4	0.6	0.5	1.3
Hong Kong, China	1.7	-0.7	2.9	7.6
Korea	0.2	-2.4	0.1	1.2
Taipei,China	0.4	-0.4	0.5	1.6
Indonesia	0.2	0.0	0.1	0.9
Malaysia	1.7	0.0	0.4	2.9
Philippines	0.3	0.0	0.0	0.7
Singapore	1.2	-3.5	3.0	9.0
Thailand	0.9	0.9	1.4	3.2
Viet Nam	1.0	0.0	1.1	1.1
Total	0.5	-0.3	0.6	2.0

GDP = gross domestic product; OEF = Oxford Economic Forecasting; TFE = total final expenditure (sum of domestic demand plus exports).

^a Change in 2003 forecast pre- and post-SARS (ADB estimates).

Source: Oxford Economic Forecasting; staff estimates.

that economy were generally better than many had feared. On the whole, the consumer results have been at the better end of estimates, largely because there was some opportunity for sales to rebound in June after SARS started to fade. The tourism rebound, in contrast, looks likely to take some time to fully materialize as recent data point to an emerging upturn but not yet a full recovery.

Even based on a quite favorable interpretation of the data and forecasts, the GDP losses for some economies are estimated to be very large: for Hong Kong, China and for Singapore up to 3% of GDP looks likely to have been lost to SARS. This rises to 7–9% for losses in total final expenditure, which more closely reflects actual business losses. The GDP losses for some other economies are small because of the offsetting large decline in imports (Korea; Malaysia; Taipei,China). For the PRC, the still quite low level of foreign tourist receipts versus strong merchandise exports also limited the visible costs, though the consumer spending shortfall attributable to SARS may be around US\$4 billion. The PRC's total expenditure loss may have been as high as US\$18 billion, or 1.3% of GDP. Nevertheless, the impact of SARS in the PRC seems to be moderate. This is confirmed by the recent statistical releases in the PRC that point to a strong economic recovery from the end of the second quarter. High government spending, continued strong investment, and buoyant exports all helped mitigate the epidemic's adverse impact on consumption and tourism.

Overall, the assessment provides a fairly comprehensive indication of the likely economic costs of the SARS outbreak across Asia. But there may be yet further losses linked to potentially long-lasting, or "long-tail", problems, such as delayed effects on exports and investment that are not currently identifiable. For example, investors may become wary of the

threat posed by health issues. To reduce such long-term negative impacts, it is crucial that Asian governments take measures to minimize the risk of another outbreak of SARS or other contagious diseases.

Conclusions and Policy Implications

Estimating the impact of an event such as SARS is a difficult and imprecise “science”. Indeed, estimates will remain subject to many errors even after all the data become available. Imperfections have to be accepted but analysts can learn from experience, create “rules of thumb”, and use this knowledge to gain useful insights that can be called upon when forecasting other major economic events.

Using the data for the second quarter, it is possible now to be more precise in defining the cost of SARS to developing Asia. Similar to results from some earlier attempts, the analysis of this section reveals that SARS has caused significant losses in several Asian economies, although it has not proved as catastrophic as some feared back at the height of the outbreak in April. The result points to the cost of SARS in terms of lost GDP in nominal terms as being about US\$18 billion for East and Southeast Asian economies, a loss of about 0.6 percentage points for 2003’s growth rate for these economies. The total final expenditure cost is likely to be close to US\$60 billion, about 2 percentage points of GDP. Losses could be put higher still if SARS has created a long-tail problem for investment and exports prospects. These economic costs are very high compared to the actual scale of the disease—representing about US\$2 million per person infected based on the GDP estimate, and US\$6 million using the total final expenditure estimate. Had the disease lasted two quarters instead of one, with continuing impacts into late 2003 and early 2004, the losses could easily have been two or three times the figures quoted.

SARS disrupted short-term economic prospects but also served as a wake-up call to governments and public health organizations. The experience of dealing with SARS carries long-term lessons. In view of the high costs imposed by health scares, countries need to take proactive and forward-looking measures to reduce the risks and costs of SARS and outbreaks of other contagious diseases. A few general points may be noted:

- The experience of dealing with SARS shows that rapid economic growth must be accompanied by social development, including adequate investment in public goods, such as primary health care and education.
- Financing and governance in the health sector should be strengthened to improve efficiency and effectiveness, particularly in rural areas where many of the poor cannot afford health services. The weakness of the PRC’s rural health system was a particular concern. Had the disease spread into underequipped rural areas, the consequences could have been dire. Much work needs to be done to strengthen health and other infrastructure in rural PRC and in other developing countries. Even the more sophisticated health care systems in Canada; Singapore; and Taipei, China, where the case numbers were low, proved to have deficiencies, and the aim now must be to maintain public confidence. Efforts also need to continue in improving the systems for monitoring

health risks and operation of health checks on travelers in the event of outbreaks of serious, contagious diseases, and for the management of hospital rapid reaction and isolation units.

- Changes in building regulations may have to be considered with reference to the outbreak in one particular building (Amoy Gardens) in Hong Kong, China, where evidence seems to point to public health hazards within the building structure and maintenance. This would impose some costs in terms of refurbishments and new construction. Given the problems of the property sector in Hong Kong, China since 1998, such changes may require some initial government subsidies to spur rapid action.
- It is worth noting that much of the cost of SARS fell directly on businesses in the region, not governments. This may suggest that local businesses or business organizations may be more willing to support (and finance) policies aimed at curbing health risks. Some of the costs of new health and safety programs might also be recouped via contributions from companies.
- A good communications strategy based on transparent, accurate information is very important during crises. As a general point, rapid statistical analysis should be published to improve predictions of contagion rates. This is critical both for the marshaling of government and medical resources and for informing the public. Economic analysis of the experience of SARS needs to be widely disseminated to improve the understanding of the impact of SARS-type shocks and the feasibility of spending increases aimed at reducing such health risks. Costs of implementing new policies can be compared to the cost of the SARS outbreak.
- Regional cooperation is essential to contain diseases such as SARS. In a globalized world, it does not take long for something like SARS to move across borders and to spread worldwide. Given the high spillover costs to other countries from the SARS outbreak, it is beneficial for countries that were not directly affected to contribute in the prevention, control, and treatment of SARS. In a sense, institutions combating contagious diseases have become a global public good and require international efforts. The burden, of course, needs to be appropriately shared to avoid “free riding”.
- Faced with clearly global health threats, there has to be a global rapid-response mechanism with a particular focus on highly contagious diseases. Research into these diseases, preventive measures, and their treatment are tasks requiring global coordination, as is the task of coordinating action when outbreaks threaten. Fortunately, organizations to do this are established and were brought into focus by the outbreak of SARS. Their role was fairly successful given the infrequent nature of the event and impossibility of running serious rehearsals. A large part of the costs involved must fall on the wealthier countries: they can hardly be imposed on developing countries, where the limited amounts of money available locally must be spent on improving basic health care and public health standards. The latter are part of the solution to the problem although they appear rather “low technology” and pedestrian compared to leading-edge medical research. The problems and costs imposed by outbreaks may be global but the heavy burden of the

costs of prevention (even though this is a global public good) may fall unequally on developing countries. It is clearly more fair and appropriate that international institutions should assist with at least part of these additional costs.

- The analysis reveals that impact of SARS appears to be greater in those economies that were already weak before the SARS outbreak, than those with strong growth momentum. Overall strengths of an economy help it guard against adverse shocks such as SARS.

These recommendations are clearly not exhaustive. Although the details of specific projects and costs cannot be examined on a country-by-country basis here—such as upgraded hospital facilities, sewage and water treatment plants, building regulations, and food standards—if a single, short-lived health scare has cost East and Southeast Asia an estimated US\$18 billion in GDP in nominal terms and nearly US\$60 billion in overall loss in demand and in business revenue, as measured by total final expenditure, then new measures look more cost effective than most people would have believed before the SARS event.

Endnote

- ¹ For the purposes of this part of the *Update*, East and Southeast Asia comprises the People's Republic of China; Hong Kong, China; Indonesia; Republic of Korea; Malaysia; Philippines; Singapore; Thailand; Taipei, China; and Viet Nam.