REPORT

CENTRE FOR INTERNATIONAL ECONOMICS

Economic benefits from an AFTA-CER free trade area

Year 2000 study

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Centre for International Economics
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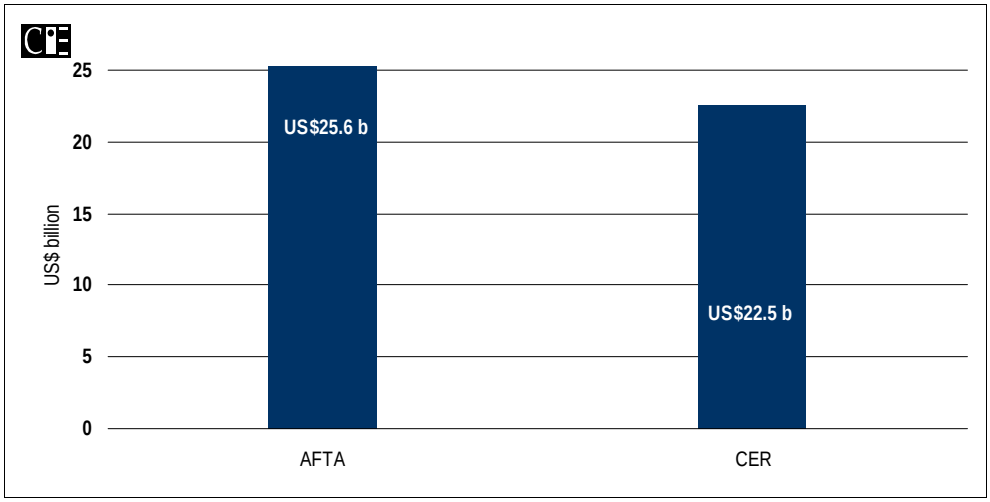
Glossary

AFTA	ASEAN free trade area
APEC	Asia Pacific Economic Cooperation
ASEAN	Association of South East Asian Nations
CEPT	Common effective preferential tariff
CER	Australia New Zealand Closer Economic Relations Trade Agreement
FTA	Free trade area
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GDP	Gross domestic product
GNP	Gross national product
GTAP	Global Trade Analysis Project
MFN	Most favoured nation
NAFTA	North American Free Trade Agreement
OECD	Organization for Economic Cooperation and Development
OPEC	Organization Petroleum Exporting Countries

Summary

- There are economic benefits for all countries from forming an AFTA-CER Free Trade Agreement. All countries gain in terms of productivity, investment, income and welfare.
- The gains from forming an AFTA-CER free trade area are estimated to be US$48.1 billion of GDP (in net present value terms over the period 2000 to 2020). The gains are US$25.6 billion for AFTA, and US$22.5 billion for CER (see chart 1), of which New Zealand gains US$3.4 billion. The gains rise through time reaching around 0.3 per cent of additional GDP by 2010 for both AFTA and CER. For the newer ASEAN members, the gains in GDP range between 0.1 and 0.4 per cent of GDP per annum.
- The gains in welfare (measured by real consumption) would be larger than the gains in real income since countries can borrow against their higher earning potential. Real welfare could rise by more than 1 per cent for Malaysia, Singapore and Thailand by 2005 over what it might otherwise be. For AFTA as a whole the gain in real welfare is 1 per cent above what it would otherwise be in 2005 and for the CER the corresponding gain in welfare is over 0.6 per cent.

1 **Quantifiable benefits from AFTA-CER** NPV of additional GDP[a]



[a]GDP discounted using real interest rate of 3 per cent over period 2000–20.

Data source: APG-Cubed model.

- The higher productivity and efficiency of resource use in each economy increases the return on capital and therefore increases investment. Some of this extra beneficial investment comes from offshore. For AFTA the extra capital inflow from AFTA-CER liberalisation amounts to US$30.9 billion over the decade to 2010 (in discounted terms) and for CER the extra capital inflow is $7.7 billion. The inflow of foreign capital causes the real exchange rate of each country to appreciate against the US$ above what it might otherwise be. The real appreciations are small and vary from 0.4 per cent to 1.2 per cent above baseline. With slightly stronger currencies and higher demands for investment goods as well as final consumption there is some initial diversion of exports to the domestic market. But once investments have been made and domestic production increases there is a pickup in exports and, with less capital inflow required, by around 2014 real exchange rates are back to where they were before the formation of AFTA-CER.
- This study extends an earlier 1997 companion study by including barriers to services trade and the effect of trade liberalisation on stimulating productivity in the country liberalising. This analysis also includes the members of ASEAN that joined after formation of the group in 1967. The gains are nearly three times those estimated in the earlier 1997 study.
- The scenario modelled is for a free trade area between members of AFTA and CER with zero tariffs on goods and services by 2005.
- Some of the benefits from forming an AFTA-CER free trade area, such as the gains that naturally follow from closer economic and cultural linkages, would be captured in the productivity effects measured in this study. As economies integrate so contacts, networks and trust grows so that confidence in business relationships follow. Some of these effects will be implicitly included in the historical parameters used to estimate the productivity effects.
- AFTA-CER could also offer other benefits not quantifiable in this study. AFTA-CER could be complementary to other initiatives to liberalise trade — such as those within APEC and the WTO multilateral context. AFTA-CER would signal a move to liberalisation by a significant region of the world and nine members of the potentially new grouping are also members of APEC. If AFTA-CER encourages liberalisation in a wider context such as APEC the benefits would be larger. APEC covers much more trade, including trade with some larger economies, and the APEC liberalisation is on an open regionalism (i.e. MFN) basis. Because of the potential complementarity of AFTA-CER with APEC and WTO initiatives which could yield larger gains, an earlier establishment of the FTA is far preferable to a later one.

1 Introduction

IN OCTOBER 1999, Ministers from ASEAN and CER members agreed to look into further integrating trade and investment between the two regions through a regional trade agreement. To this end, an AFTA-CER Free Trade Area Task Force was established comprising senior political figures, academics and senior officials from ASEAN and CER. At the inaugural meeting of the task force in February 2000, it was agreed that any free trade area (FTA) should be comprehensive in scope and cover trade in all goods, services and investment, including technical barriers to trade and mutual recognition arrangements (DFAT 2000). The Task Force decided to undertake a study of the benefits and costs of the proposed FTA as part of its program of work. It was also agreed that a 1997 study of the economic benefits of an AFTA-CER FTA undertaken by the Centre for International Economics (CIE) would be updated.

This report updates and extends the previous 1997 study conducted by the Centre for International Economics into the economic benefits of a free trade area between the ASEAN members and Australia and New Zealand.

The new focus of this study

The previous study on the economic benefits arising from an AFTA-CER FTA (CIE 1997) found that the easily measured benefits from a free trade area in merchandise goods only was relatively small. It was found that benefits of around US$16 billion, or a 0.1 per cent permanent increase in GDP above what it might otherwise have been, would accrue to participants in the FTA. But in arriving at this estimate, only liberalisation of merchandise trade was considered.

Barriers to trade in services were not included in the original study because of the lack of comprehensive quantitative data and the early emphasis of AFTA on trade in goods. Furthermore, only three sources of gain from trade liberalisation were evaluated — the better use of the economy's resources (allocative efficiency), the terms of trade (exchange rate) effect and the dynamic gains associated with faster capital accumulation. This

study updates and expands the work undertaken in 1997. It includes two additional sources of benefit from trade liberalisation that were not previously quantifiable as well as updating tariff data. The current report incorporates:

- liberalisation of trade in services;
- endogenous productivity gains associated with trade liberalisation; and
- updated tariff rates, coverage of items included in AFTA and the decision of ASEAN members to implement AFTA one year earlier.

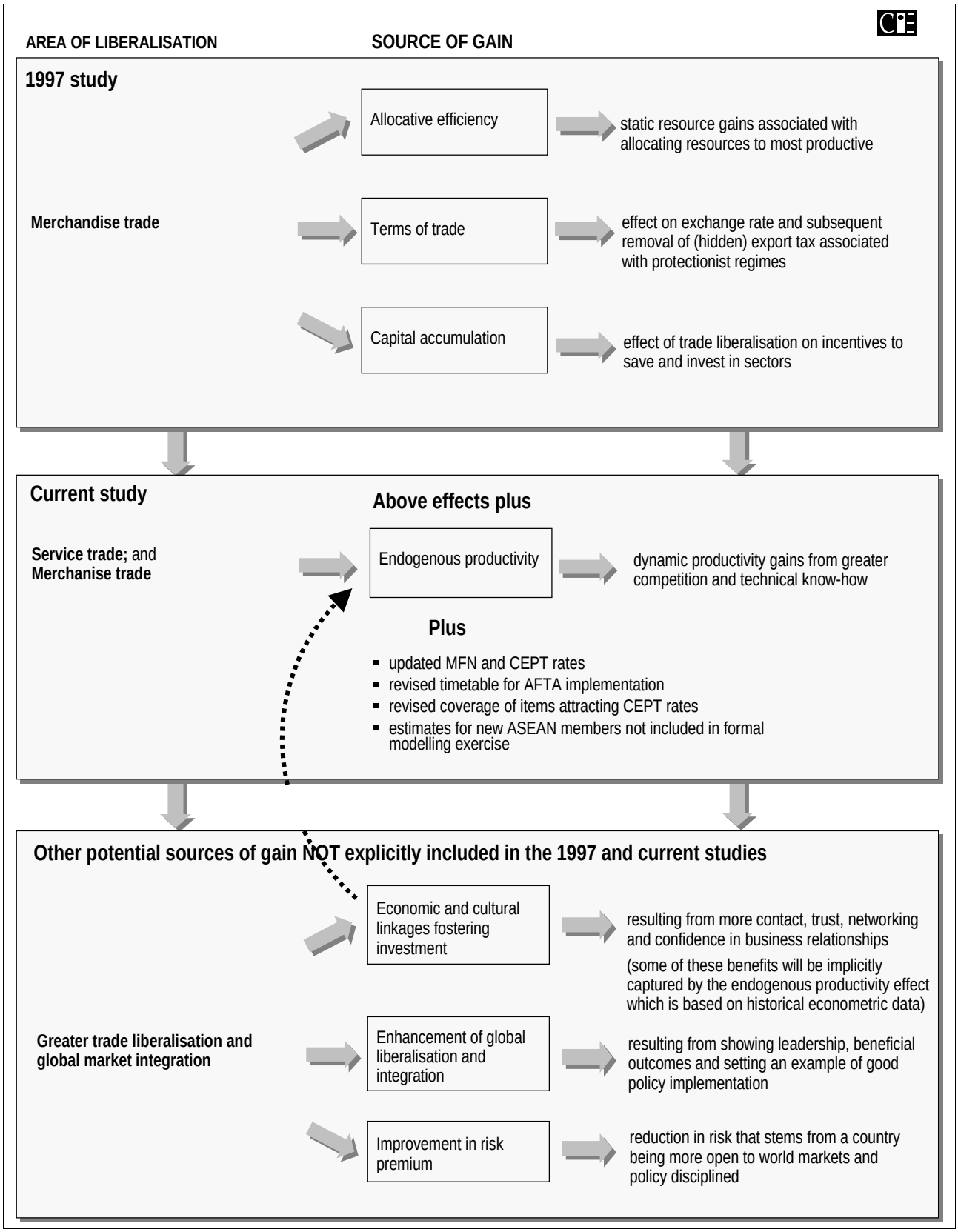
Chart 1.1 shows the potential sources of gain from trade liberalisation included in this study of the economic benefits from an AFTA-CER free trade area. The chart also shows the additional (potential) sources of gain included in this study but not included in the 1997 study.

Trade liberalisation and endogenous productivity gains

Recent advances in international trade theory and new empirical research mean that the once intuitively obvious sources of gain from trade liberalisation can now be quantified and incorporated into economywide models. For example, for many years researchers have observed that whenever there has been significant trade liberalisation by countries there has been a boost to productivity and growth well in excess of the static allocative efficiency gains suggested by traditional analysis. The problem has been how to estimate the size of this effect — that was until Frankel and Romer (1999) estimated the effect of opening to trade on endogenous productivity (Stoeckel and Corbet 1999, p 91).

The endogenous productivity effect occurs when trade is expanded. Trade liberalisation can place extra competitive pressure on once protected industries and new foreign investment opportunities leading to technical know-how and capital accumulation can stimulate productivity and lead to higher growth. Recent work by Stoeckel, Tang and McKibbin (1999) has quantified the benefits from endogenous productivity gains brought about by trade liberalisation and the effect has been seen to be potentially significant.

1.1 Sources of potential gain from forming a FTA



Inclusion of the services sectors and services trade

In the 1997 AFTA-CER study only liberalisation of tariffs on merchandise trade was considered — the removal of non-tariff barriers, which are particularly important for trade in services, was not considered. Excluding services, while necessary in 1997, is now seen as a major shortcoming because services play a large and increasing role both in an economy and in international trade as economies become wealthier. Also, technology has now made many previously non-traded services tradeable. As noted earlier, there were two reasons for excluding services trade from the previous analysis — the paucity of data and the earlier emphasis of AFTA on trade in goods. But things have since changed.

For one thing, services were put on the agenda for liberalisation at the fifth summit meeting of heads of government of ASEAN countries (Bangkok, December 1995). At the sixth ASEAN Summit (Hanoi, December 1998) the decision was taken to further expand service liberalisation. Also, the agreement of the AFTA-CER Task Force was that any FTA should be comprehensive in scope and cover substantially all trade in goods and services.

On the issue of data, while it is still easy to be critical about the amount and accuracy of the data on barriers to services trade, some significant work has been undertaken since 1997 (see for example Dee and Hanslow 2000). Increasingly, it looks like barriers to trade in services are often as large as those typically found for agricultural products, which are significant. Even though the data for services barriers are still far from complete, a much bigger error would be made if they were excluded from the analysis on the basis of lack of data reliability. The solution to the paucity of data is more analysis and measurement, not the omission of services from the analysis. Incorporation of the service sectors is now required for completeness. Failure to do so would lead to a considerable underestimation of the potential benefits from a FTA. This study includes those advancements that have been made in looking at the effects of non-tariff barriers on the cost of service provision.

Tariff rates and early implementation of AFTA

Since the 1997 study the six original signatories to Agreement for the ASEAN free trade area — Brunei Darussalam, Indonesia, Malaysia, the Philippines, Singapore and Thailand — have decided to advance the implementation of AFTA by one year from 2003 to 2002. Member countries have also agreed to eliminate tariffs as soon as possible and accelerate transfer of products that are currently not included in the preferential tariff

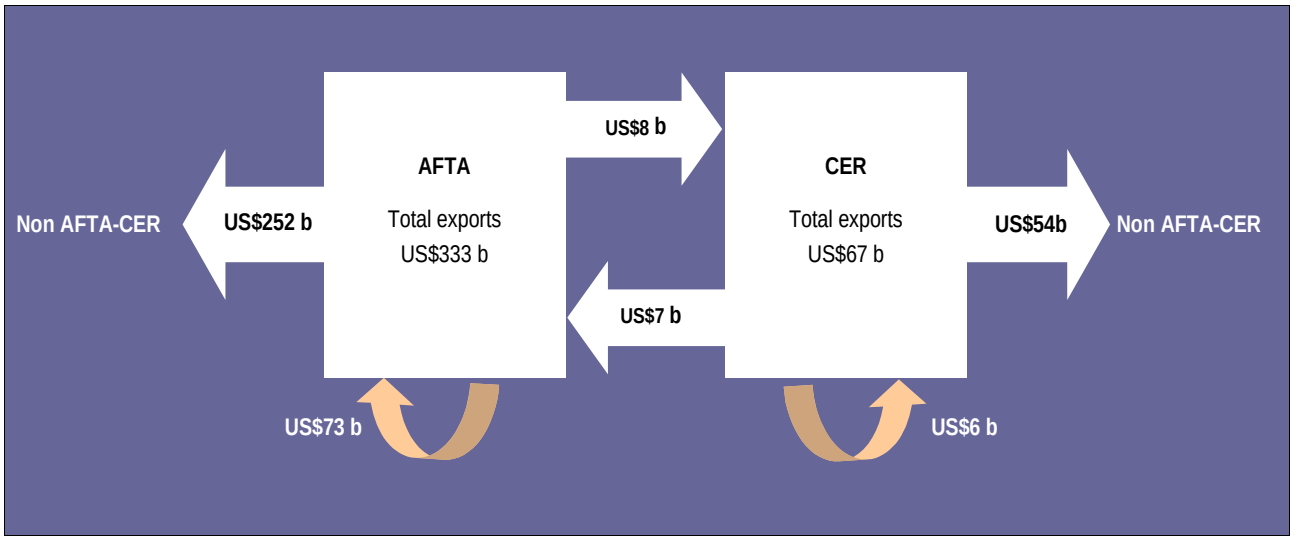
reduction scheme to the scheme. These recent developments are included in the quantitative analysis as are updates of the tariff rates levied on imports from ASEAN, CER and other nations.

The AFTA-CER link in perspective

If the free trade area between AFTA and CER were to be implemented today, it would encompass a market of over 530 million people, with the 12 member nations having a combined gross domestic product of around US$990 billion. Australia and New Zealand account for about 45 per cent of combined AFTA-CER GDP. At this level of combined GDP, AFTA-CER currently represents only 3.3 per cent of world GDP. However, AFTA has been one of the faster growing areas of the world notwithstanding the recent Asian crisis. Therefore, while AFTA-CER would be a small trade grouping compared to, say, NAFTA or the European Union, it would be a potentially important trade link for members.

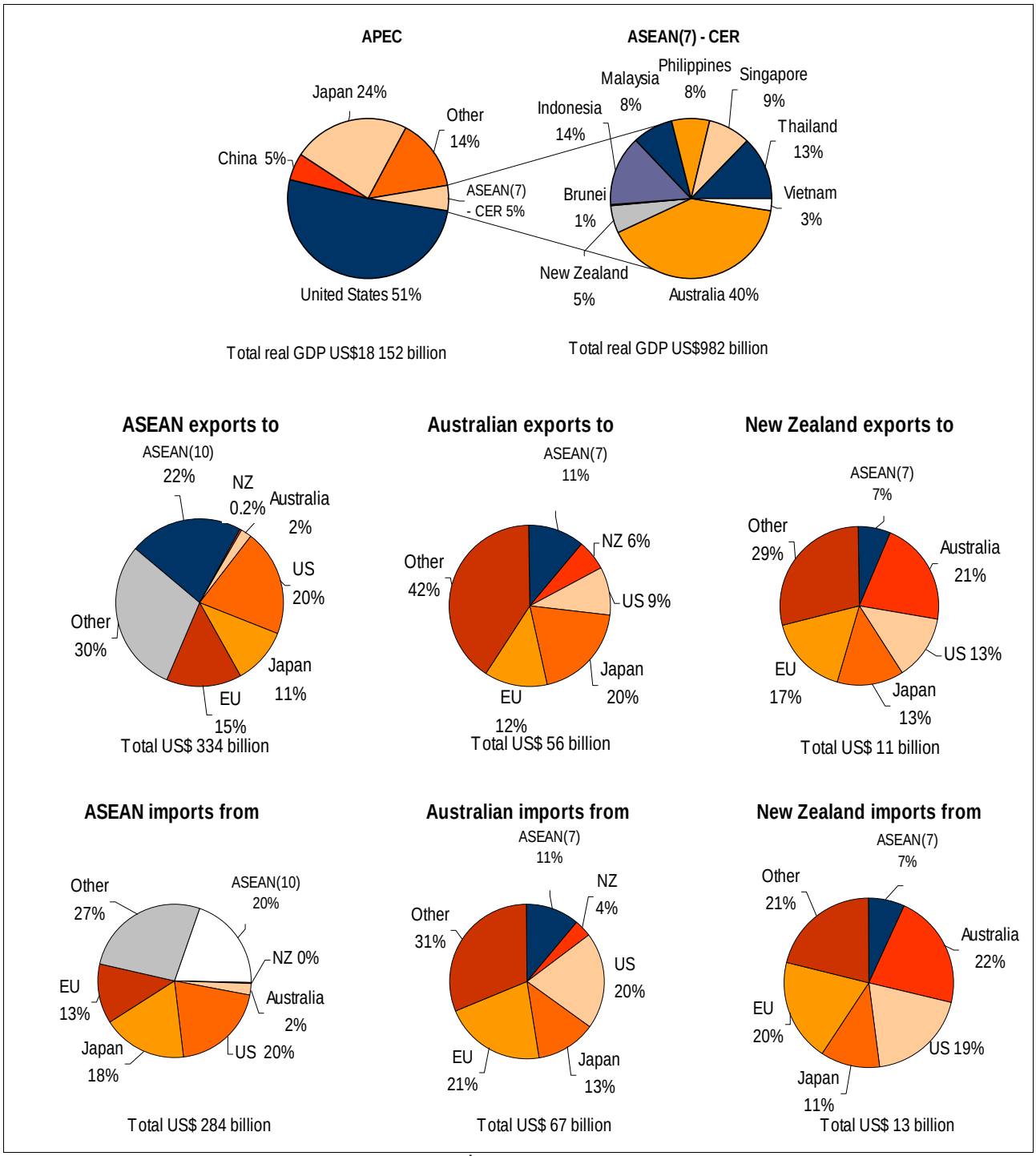
The major exports between AFTA and CER are summarised in chart 1.2. The summary shows that exports from AFTA to CER were US$8 billion in 1998 while exports the other way were US$7 billion. For both AFTA and CER the major exports from AFTA and CER are to countries outside the potential trade grouping. For AFTA, exports outside the proposed free trade area were US$252 billion and for CER they were US$54 billion in 1998. AFTA accounts for about 10 per cent of CER's exports but CER accounts for about 3 per cent of total ASEAN trade (exports plus imports).

1.2 **Bilateral, external and internal trade for AFTA and CER:** 1998



Data source: The APEC Region Trade and Investment, various issues.

1.3 GDP and merchandise trade of ASEAN and CER members[a, b]



[a] GDP values are for 1999, merchandise trade figures are for 1998. [b] The ASEAN members of Cambodia, Lao PDR and Myanmar are not members of APEC and hence are excluded from the GDP calculations. These countries have a combined GDP of around US$9 billion. Estimates of CER trade with Cambodia, Lao PDR and Myanmar are not available and hence these countries are not included in the Australian and New Zealand trade profiles depicted.

Data source: ASEAN Secretariat 2000a, DFAT 1999, WTO 1999, and CIE calculations.

Chart 1.3 shows more detail on the relative sizes of the ASEAN and CER member economies and their major trading partners. When drawing conclusions from the chart, care should be taken to allow for the influences of the East Asian financial crisis. For example, in 1998 ASEAN members experienced a large — around US$50 billion — balance of merchandise trade surplus (the difference between exports and imports). However, this large surplus is, in part, likely to reflect the effects of the East Asian financial crisis, during which the exchange rate of (some) ASEAN members depreciated markedly. This had the effect of making ASEAN exports cheaper and imports more expensive. As a result of the exchange rate depreciation and the general decline in economic activity, we would expect imports by ASEAN members to decline markedly, and this was observed. In 1998 ASEAN imports were around 24 per cent lower than in 1997, with imports from Australia and New Zealand falling by 27 and 32 per cent respectively. ASEAN exports to Australia and New Zealand were 16 and 6 per cent (respectively) higher in 1998 than in 1997.

Report structure

Chapter 2 gives some brief background to the ASEAN and CER free trade areas necessary to interpret the relevant baseline from which the benefits are evaluated. Particular emphasis is given to outcomes of the fifth and sixth ASEAN Summits (Kuala Lumpur, December 1995 and Hanoi, December 1998 respectively) and the intervening Informal ASEAN Summits. The outcomes of these Summits affect the pace of AFTA implementation and the move towards free trade. When assessing the economic benefits of an AFTA-CER link, it is assumed that Australia and New Zealand comply with the AFTA timetable specified by the ASEAN members.

Chapter 3 outlines the simulations to be modelled. The APG-cubed model and the simulations run are discussed in greater detail in appendixes A and B. Chapter 4 presents the results of the modelling exercise to estimate the impact of the AFTA-CER link on member economies. Results are projected until the year 2020, and include an analysis of how those developments might be affected by trade liberalisation as agreed to by APEC members. Detailed results from the APG-cubed model are presented in appendix C.

Chapter 5 investigates how an AFTA-CER free trade area is likely to affect those ASEAN members that have joined the group since it was originally formed. The final chapter summarises the key findings of the report and puts these into context of the overall costs and benefits of an AFTA-CER link.

2 AFTA and CER

History and evolution of AFTA

In analysing the benefits from a possible free trade area between AFTA and CER, it is important to appreciate the extent and coverage of goods within each free trade area now so an appropriate baseline can be generated. The economic benefits from the AFTA-CER link is then the difference between the baseline (or what would happen in the absence of an AFTA-CER link) and the 'simulated' results of what might happen if the free trade area was formed. To appreciate what would happen in the absence of an AFTA-CER link some background on the evolution of the two FTAs is necessary so judgements about timing and coverage can be made.

Association of South East Asian Nations

The Association of South East Asian Nations was formed in 1967, the founding members being Indonesia, Malaysia, the Philippines, Singapore and Thailand. The vision upheld by the founding members was all countries in the South East Asia region cooperating actively towards peace, stability, progress and prosperity.

ASEAN was founded to provide a framework and mechanism for regional cooperation (ASEAN Secretariat 2000c). The ASEAN Declaration (Bangkok 1967) identified the first three aims and purposes of ASEAN as:

- to accelerate the economic growth, social progress and cultural development in the region through joint endeavours;
- to promote regional peace and stability; and
- to promote active collaboration and mutual assistance on matters of common interest in the economic, social, cultural, technical, scientific and administrative fields (ASEAN Secretariat 2000c).

Although the original ASEAN concept had an economic dimension, the progress on economic integration was initially slow. The primary focus was political, with a common strategic concern about inroads by communism

from the east and the north, as well as internal insurgencies in some of the ASEAN members themselves. In April 1999, Cambodia was admitted as the tenth member of ASEAN, fulfilling the vision of the original ASEAN members to establish an organisation for all South East Asian countries. Chart 2.1 shows the evolution of ASEAN membership.

2.1 **Evolution of ASEAN membership**

ASEAN(5)	ASEAN(6)	ASEAN(7)	ASEAN(9)	ASEAN(10)
Indonesia Malaysia Philippines Singapore Thailand	+ Brunei	+ Vietnam	+ Myanmar Lao PDR	+ Cambodia
August 1967	**January 1982**	**July 1995**	**July 1997**	**April 1999**

ASEAN free trade area

In 1977, ASEAN members adopted a limited preferential trade arrangement. Initially, the arrangements were narrow in scope and coverage. By 1980 it covered an estimated 2 per cent of intra ASEAN trade and only 5 per cent by 1985. Several reasons, including the product-by-product nature of negotiations, the non-genuine offer of preferences, high domestic content requirements, long lists of exclusions and the limited nature of preferences themselves help explain the initial negligible impact of the preferential trade arrangement.

In 1991 the idea of an ASEAN free trade area was proposed by the Thai Prime Minister and subsequently adopted in January 1992 during the fourth ASEAN Summit meeting in Singapore. At that Summit meeting ASEAN members signed the Framework Agreement on Enhancing ASEAN Economic Cooperation, which resulted in the formation of the ASEAN Free Trade Area. The strategic objective of AFTA is to increase the ASEAN region's competitive advantage as a single production unit. The elimination of trade barriers among member countries is expected to promote greater economic efficiency, productivity and competitiveness (ASEAN Secretariat 1999c). Improved competitiveness and access to a large market would encourage investment, including foreign direct investment, and help to achieve economies of scale in production and stimulate development of supporting industries.

The initial aims of AFTA were to reduce tariff rates on intra ASEAN trade to less than 5 per cent within 15 years, beginning January 1993, via a common effective preferential tariff (CEPT). Each member was to provide schedules of voluntary reductions in nominated tariff lines. The AFTA agreement was not comprehensive and members were free to exclude sensitive goods from the tariff reduction schedules.

The AFTA scheme divided goods into two categories — fast track goods whose tariffs were to be reduced to 0–5 per cent within 7 or 10 years (depending on whether the initial tariff was below or above 20 per cent) and the normal track goods on which tariffs would be reduced more slowly. Under the normal track program tariffs were to be reduced to 0–5 per cent by 2008, or by 2003 if rates were already at 20 per cent or less.

A history of accelerated trade liberalisation and increasing coverage

At both of the ASEAN Summits since the 1992 Summit, announcements were made with respect to accelerating the implementation of the free trade area. The fifth ASEAN Summit (Bangkok, December 1995) adopted the Agenda for Greater Economic Integration, which included the acceleration of the timetable for realisation of AFTA from the original 15 year time frame to 10 years. This encompassed accelerating the liberalisation of fast track items by the year 2000 (originally 2000 to 2003) and achieving normal track item liberalisation by 2003 (originally 2008). At the sixth ASEAN Summit (Hanoi, December 1998), and in the wake of the East Asian Financial crisis, the six oldest members of ASEAN agreed to advance implementation of AFTA by one year to 2002, from 2003. This course of action was taken as a means of restoring business confidence, enhancing the economic recovery and promoting growth in the region.

The accelerated trade liberalisation applies only to those tariff lines on the so-called Inclusion List (see box 2.2). The sixth ASEAN Summit (Hanoi, December 1998) saw member countries committing to accelerate, as soon as possible, the transfer of products that were not included in the tariff reduction scheme into the Inclusion List.

The sixth Summit also saw greater emphasis on expanding the range of services to undergo trade liberalisation, which was initiated at the fifth ASEAN Summit. At that Summit it was decided that ASEAN would move towards freer trade in services through the implementation of the ASEAN Framework Agreement on Services (AFAS). To implement AFAS, members undertook to enter into negotiations concerning specific commitments on market access, national treatment and additional commitments covering all service sectors and all modes of supply. Negotiations were to begin January

2.2 CEPT product lists

The requirement that CEPT rates be lower than 5 per cent by 2002 (for ASEAN(6) members) applies to only those tariff lines (products) on the Inclusion List (IL). A country can nominate that products be listed on the Temporary Exclusion List (TEL), Sensitive List (SL) or General Exclusion List (GEL) in which case that product is exempt from the 2002 requirement. It is estimated that in the CEPT 2000 package 97 per cent of ASEAN(5) tariff lines are on the IL, 2 per cent on the TEL with the remaining tariff lines (1 per cent) allocated equally between the SL and GEL. Table 3.5 in chapter 3 provides greater detail. The newer members of ASEAN have more relaxed tariff reduction schedules than those reported here.

The Inclusion List — products on the inclusion list are subjected immediately to the CEPT rate reduction. At the sixth ASEAN Summit it was announced that the ASEAN(6) members had committed to reducing CEPT rates to 0–5 per cent on a minimum of 85 per cent of IL products by 2000. This is to be increased to a minimum of 90 per cent of the IL by 2001, and by 2002 all items on the IL are to have CEPT rates under 5 per cent.

The Temporary Exclusion List — products initially excluded from tariff reductions, but then to be transferred to the IL by 2000 and CEPT rates reduced to 0–5 per cent by 2002

The Sensitive List — predominantly unprocessed agricultural products that are granted a more flexible arrangement for phasing into the Inclusion List, beginning 2001–2003 and completed by 2010.

The General Exclusion List — products permanently excluded form the CEPT scheme for reasons of national security; protection of public morals; protection of human, animal or plant life and health; and the protection of articles of artistic, historic and archaeological value.

To enjoy the reduced CEPT rates, the following conditions need to be satisfied:

- the product must satisfy the ASEAN 40 per cent content requirement;
- the product must be in the Inclusion List of both the *importing* and *exporting* countries;
- to enjoy a CEPT rate of 20 per cent or lower, the import tariff for the same product must also lower than 20 per cent in the exporting country (the 'reciprocity rule');
- the reduced CEPT rates must have been legally enacted in the importing country; and

ASEAN member countries are required to eliminate quantitative restrictions or products upon immediate enjoyment of CEPT concessions and eliminate other non-tariff barriers within a period of five years after enjoyment of the concessions.

Source: ASEAN Secretariat 2000b and CIE calculations.

1996 and conclude not later than December 1998. The initial negotiations gave emphasis to seven service sectors, namely financial services, maritime transport, telecommunications, air transport, tourism, construction and business services (ASEAN Secretariat 1995b).

At the second Informal ASEAN Summit (Kuala Lumpur, December 1997) an initial package of service liberalisation commitments were released — around one year earlier than required under the fifth ASEAN Summit. The initial package of reforms signified ASEAN's progress towards closer economic integration by establishing a free trade area in services that would compliment the free trade in goods. A second package of service liberalisation commitments was announced at the sixth ASEAN Summit in

Hanoi, December 1998. Together with the initial package of commitments, the majority of ASEAN members have made commitments in all of the priority service sectors identified at the fifth ASEAN Summit. Furthermore, the decision was taken at the sixth ASEAN Summit to expand the scope of negotiations in services beyond the seven priority areas identified at the fifth ASEAN Summit to cover all service sectors and all modes of supply. Negotiations are to begin in 1999 and end in 2001.

The key point from the above is that for the baseline of what would happen in the absence of AFTA-CER, there is no reason not to use the timetable already announced or the coverage of items for trade liberalisation. The recent history of AFTA has been one of extending coverage of goods and services for liberalisation and accelerating tariff cuts.

CER

The Australia New Zealand Closer Economic Trade Relations Agreement began in 1983, replacing the more modest New Zealand Australia Free Trade Agreement. The central provision of the CER is the creation of a WTO consistent free trade area between Australia and New Zealand.

As with AFTA, reviews of CER have resulted in a broadening of its scope and an acceleration of its implementation. Tariffs have been liberalised, non-tariff barriers removed including all quantitative restrictions on goods. The CER agreement was completed in 1990 (five years ahead of the original timetable). DFAT reports that 'all tariffs and quantitative restrictions on trade in goods have now been eliminated' (DFAT 2000). The agreement also covers services and four inscriptions (i.e. exceptions) to the CER Trade in Services protocol were removed last year (Joint Ministerial Statement 1999).

CER is seen by both governments as having been highly successful at promoting trade and a more competitive, dynamic domestic environment (NZ Ministry of Foreign Affairs and Trade). But the most telling features of the arrangement that point to the success of CER are that plans for implementation were accelerated and the scope of coverage of items extended. Other benefits from CER are that CER also 'created a more positive attitude towards liberalisation within New Zealand industry' (NZ Ministry of Foreign Affairs and Trade). In doing so, CER has enabled the New Zealand government to use the positive experience of CER to gradually reduce protection on imports from the rest of the world. So in a sense, it could be argued that the gains from CER are much greater than the simple removal of restrictions between Australia and New Zealand. This

experience may be a valuable pointer to the potential contribution AFTA-CER could make. Although AFTA-CER would be a small trade grouping by world standards, the positive experience may well encourage members to unilaterally extend the removal of trade barriers to other countries on an MFN basis. If so, the gains would be much greater.

Regarding future developments of CER, the intention is that the few remaining restrictions on trade are removed 'as and when' they become possible. There is a significant difference between AFTA and CER in the treatment of services that requires more explanation and is dealt with below. But the conclusion to be drawn from the CER experience for the baseline is that nearly all of the liberalisation has occurred. The focus of the relationship is now on regulatory initiatives such as allowing goods that can be legally sold in one country to be legally sold in the other and addressing the harmonisation of a range of measures that affect the free flow of goods and services, including those that relate to quarantine and customs issues, standards and business laws.

Services in AFTA and CER

Already noted is the current focus of liberalisation in AFTA and CER on services. Services are often not traded by their very nature and so 'barriers to trade' have not been as obvious as barriers to trade in goods. These 'barriers to trade' are often in the right to establish in another country or some other restriction.

Under CER, services are on a 'negative' list. That is, all traded service transactions can take place freely except where they are specifically listed for exemption. These service exemptions for CER are inscribed in the CER Protocol on Trade in Services. For Australia the exceptions cover items like international aviation, coastal shipping and postal services. For New Zealand, the only items on the negative list are airways services and coastal shipping.

By contrast, under AFTA, a positive list approach has been adopted (similar to that of the GATS framework). Liberalisation is negotiated sector by sector and then listed in the schedule of commitments. Because new service industries continually arise, inherently the CER arrangement on services is more liberal than for AFTA.

3 *Measuring the benefits of an AFTA-CER link*

THE PROPOSAL EVALUATED in this study is that the AFTA and CER link to form a common free trade area. The schedule of tariff reductions and the range of products subject to tariff reductions is determined by the ASEAN members — that is, Australia and New Zealand comply with AFTA and the CEPT schedule.

Before proceeding to the simulations modelled, the model used to evaluate the benefits of an AFTA-CER link is briefly discussed.

The APG-Cubed model

Forming an FTA implies a lot of significant and inter-related changes between countries. Opening to markets implies the creation of trade for countries participating in the FTA. But it can also mean diverting trade from other (and potentially lower cost) countries. Also, removing trade barriers — even in a partial FTA sense — can have large effects on the efficiency of the economy and the return to capital.

Higher returns to capital attract investment, some of which will be foreign. This higher foreign investment changes the exchange rate which has an effect on the exports and imports of a country. The higher efficiency and investment causes incomes to rise, which has an effect on demands for goods and services — some of which are imported.

In short, there are many channels of influence and the best way to capture the net effect of the impact of an FTA is through an economywide model that formally links all sectors in an economy and links trade and capital flows between countries. Also, because there are adjustment costs as a result of the ensuing resource changes that flow from an FTA (which is the flip-side of the gains), these need to be allowed for as well. FTAs are frequently phased in over time to minimise adjustment costs, and, the need to allow for the dynamic accumulation of capital over time means that any

framework should be capable of capturing these dynamic effects. The APG-Cubed model is the best framework that meets these criteria and is the model used in the previous CIE study.

The APG-Cubed general equilibrium model developed by McKibbin (1996) is a global model covering 18 countries / regions and, to keep the model to a manageable size, covers six sectors of production. Table 3.1 sets out the country and industry sector coverage used in APG-Cubed. From the table it can be seen that APG-Cubed separately identifies 13 out of the 21 members of APEC. These 13 members are responsible for around 90 per cent of total APEC production. The model also separately identifies five of the ten ASEAN members and both of the CER participants. The five ASEAN members of Indonesia, Malaysia, the Philippines, Singapore and Thailand (ASEAN(5)) account for around 93 per cent of total ASEAN production.

The APG-Cubed framework is a detailed global model and requires extensive amounts of data on an economy's production relationships, national accounts and all bilateral trade flows. It has not been possible to include the five smaller and later entrants to ASEAN, which account for 7 per cent of ASEAN production, in the formal modelling exercise. However, a more partial estimate of the gains for these later joiners of ASEAN has been made separately and is described later (chapter 5). The APG-Cubed model is explained in greater detail in appendix A.

3.1 **Country and industry coverage of APG-Cubed**

Countries		***Industry sectors***
Australia	New Zealand	Energy
China	OECD Europe and Canada	Mining
Chinese Taipei	OPEC (ex. Indonesia)	Agriculture
Eastern Europe	Other	Non-durable manufacturing
Hong Kong, China	Philippines	Durable manufacturing
India	Republic of Korea	Services
Indonesia	Singapore	
Japan	Thailand	
Malaysia	United States	

The simulations being modelled

As noted above, to estimate the impact of an AFTA-CER link an appropriate counterfactual (the baseline) has to be generated since many tariffs are scheduled to fall as a result of the Uruguay Round and the APEC

Bogor Declaration. However, the APEC liberalisations announced under the Bogor Declaration are voluntary and do not have the legal force that MFN tariff reductions have as agreed and signed under the Uruguay Round. Therefore, APEC trade liberalisation is not included in the 'business-as-usual' baseline. However, APEC liberalisation is potentially important and therefore it is simulated separately. That is, an AFTA-CER link with and without APEC liberalisation is evaluated. We consider three scenarios:

- AFTA-CER scenario — a free trade area between members of AFTA and CER is formed, with tariff rates being between 0–5 per cent by 2002 and reduced to zero per cent by 2005;
- AFTA-CER & APEC liberalisation scenario — preferential and free trade between AFTA and CER countries by 2005, given APEC liberalisation as set out in the Bogor Declaration; and
- APEC liberalisation scenario — APEC liberalisation without AFTA-CER liberalisation.

Model results are presented as a change from baseline outcomes until the year 2020. A stylised representation of the tariff reduction scenarios simulated is shown in chart 3.2.

The baseline

The baseline represents the business as usual scenario, namely:

- there is no AFTA-CER link;
- no APEC trade liberalisation; but
- there is trade liberalisation on a MFN basis by individual countries as agreed under the Uruguay Round of the GATT; and
- there is the schedule of preferential tariff cuts and trading arrangements as announced by AFTA countries.

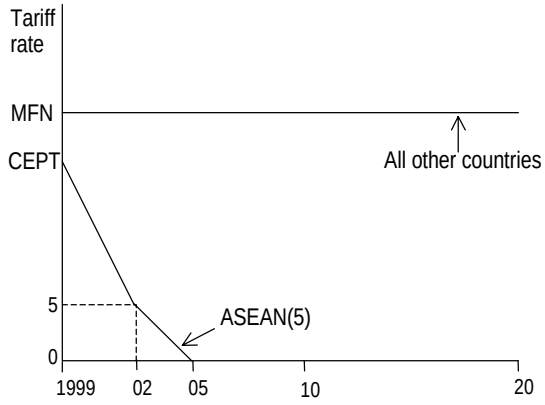
The baseline sees intra ASEAN trade attracting CEPT rates while all other trade (extra ASEAN and intra trade between non-ASEAN members) attracts post Uruguay Round most favoured nation tariff rates.

Most favoured nation tariff rates

Table 3.3 shows the post Uruguay Round MFN tariff rates for the various countries/regions and industry sectors identified in the APG-Cubed model. Under the baseline these rates are applied to all trade between non-

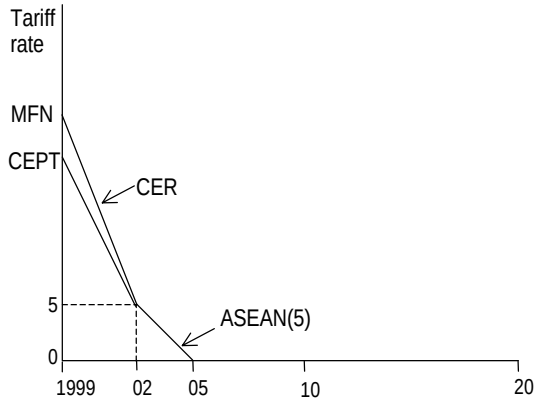
3.2 **Stylised representation of tariff reduction scenarios**

Baseline 'business-as-usual'



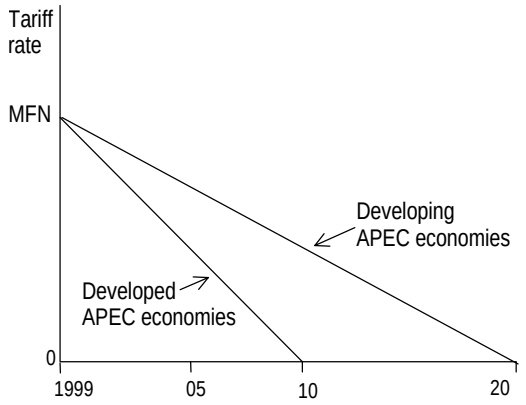
- Intra ASEAN trade attracts CEPT rates
- Exports to ASEAN members from non-ASEAN countries attract MFN tariff rates
- Exports to and from all other countries attract MFN tariff rates

AFTA–CER link



- Australia and New Zealand (CER) form a FTA with AFTA
- CER offers preferential entry to ASEAN exports, which is reciprocated by ASEAN members
- CER adopts CEPT reduction schedule and reduces MFN rates to 0–5 per cent by 2002 and to zero by 2005

APEC liberalisation



- Bogor Declaration implemented by APEC members
- Developed APEC economies reduce MFN rates to zero by 2010
- Developed APEC economies reduce MFN rates to zero by 2020

ASEAN economies and to exports destined for ASEAN countries but originating elsewhere.

The MFN tariff rates reported were calculated from the Global Trade Analysis Project (GTAP) version 4 database (McDougall *et al* 1998). In the case of services, there are no formal barriers to trade — protection, to the extent it exists, is in the form of non-tariff barriers. For example, the trade barriers in question may be policies that prevent the uptake of best practice techniques. This may encompass barriers to the entry of foreign investment and management personnel, or heavy-handed regulation and licensing requirements. As such, there is no MFN 'tariff' for services. Rather, the percentage cost reduction achievable following service trade liberalisation is reported in table 3.3. These rates were derived in earlier CIE work. A full description of how these rates were calculated can be found in CIE (1999, p.4–5).

Common effective preferential tariff rates

As noted in chapter 2, the six original members of ASEAN agreed at the sixth ASEAN Summit (Hanoi, December 1998) to advance implementation of AFTA by one year from 2003 to 2002. Members countries also agreed to accelerate transfer of products outside of the CEPT scheme into the scheme (see below). These decisions mean that by 2002, 100 per cent of items

3.3 **Estimated post Uruguay Round MFN rates**

Country/region	*Energy*	*Mining*	*Agriculture*	*Durables*	*Non-durables*	*Services*[a]
	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
Australia	0.5	0.4	0.6	5.2	8.5	1.6
China	8.7	3.2	14.6	32.7	36.1	2.2
Chinese Taipei	6.8	0.9	21.1	13.6	7.2	1.7
Eastern Europe	4.4	9.0	4.5	10.1	9.7	1.9
Hong Kong	0.0	0.0	0.0	0.0	0.0	2.5
India	13.8	3.2	15.9	46.9	41.8	2.1
Indonesia	3.3	1.5	8.0	11.3	9.4	2.0
Japan	0.0	0.0	90.5	6.4	0.5	1.5
Malaysia	2.4	1.3	5.6	12.9	5.6	1.9
New Zealand	0.0	0.4	0.1	2.9	4.2	1.7
OECD Europe and Canada	1.2	0.1	5.4	8.9	3.5	1.4
OPEC (ex. Indonesia)	7.4	12.0	10.0	12.3	12.0	2.2
Other	9.4	5.3	8.3	14.5	15.0	2.1
Philippines	0.9	1.9	22.4	22.0	17.1	2.1
Republic of Korea	1.1	1.7	23.2	11.9	7.5	1.7
Singapore	0.0	0.0	6.5	4.6	0.1	2.2
Thailand	1.5	1.4	15.7	21.4	21.6	2.2
United States	0.1	0.1	0.3	3.5	1.1	1.4

a Percentage cost reduction achievable following service trade liberalisation.

Source: CIE 1999, page 9 (tables 2.5 and 2.6).

attracting CEPT rates (the Inclusion List) will have tariffs of between 0–5 per cent (with some flexibility).

It has been assumed that ASEAN(5) members will abolish all tariffs on the Inclusion List items three years after the implementation of AFTA — that is, in 2005. This assumption follows the decision taken at the sixth ASEAN Summit that ASEAN's newer members — Lao PDR, Myanmar and Vietnam — will abolish tariffs on CEPT products three years after tariffs have been reduced to between 0–5 per cent (ASEAN Secretariat 1999a).

Table 3.4 shows the CEPT rates used in the modelling. CEPT rates are available for all products, that is goods, traded internationally. As such, there is no CEPT rate for services (as they are not 'goods'). To overcome this problem we have assumed that the MFN rates for services reported in table 3.3 is the same as the CEPT rate, which, under AFTA, will be reduced to between 0–5 percent by 2002 and (as we have assumed) abolished by 2005. If the service cost reduction achievable was under 5 per cent as of 1999, then that rate is maintained until 2002 upon which (further) trade liberalisation begins so that as of 2005 trade in services has been fully liberalised and all achievable cost reductions realised.

3.4 CEPT rates by APG-Cubed sector classification

ASEAN country	*Year*	*Energy*	*Mining*	*Agriculture*	*Durables*	*Non-durables*	*Services*[a]
		Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
Indonesia	1999	1.8	0.6	8.0	7.7	11.3	2.0
	2002	1.7	0.6	4.4	4.0	4.6	2.0
	2005	0.0	0.0	0.0	0.0	0.0	0.0
Malaysia	1999	1.0	0.1	1.4	4.5	3.7	1.9
	2002	0.8	0.1	0.9	2.5	2.7	1.9
	2005	0.0	0.0	0.0	0.0	0.0	0.0
Philippines	1999	0.9	1.4	7.3	5.6	8.7	2.1
	2002	0.7	1.1	3.6	3.6	4.0	2.1
	2005	0.0	0.0	0.0	0.0	0.0	0.0
Singapore	1999	0.0	0.0	0.0	0.0	0.0	2.2
	2002	0.0	0.0	0.0	0.0	0.0	2.2
	2005	0.0	0.0	0.0	0.0	0.0	0.0
Thailand	1999	1.5	1.4	15.0	9.4	13.3	2.2
	2002	1.1	1.0	4.5	4.2	4.9	2.2
	2005	0.0	0.0	0.0	0.0	0.0	0.0

[a] Percentage cost reduction achievable following service trade liberalisation.

Source: CIE 1999, ASEAN Secretariat 1999b and CIE calculations.

CEPT coverage

All intra ASEAN trade does not attract the CEPT rates outlined above in table 3.4. CEPT rates are applicable only to those tariff lines (products) that countries *have placed on the Inclusion List*. As noted in chapter two, an important outcome of the sixth ASEAN Summit was the decision to accelerate transfer of products currently not included in the (preferential) tariff reduction scheme to the Inclusion List. Table 3.5 shows the share of tariff lines in each of the Inclusion (IL), Temporary Exclusion (TEL), Sensitive (SL) and General Exclusion Lists (GEL) for the various ASEAN(5) members. As items in the TEL are to be transferred to the IL by 2000, this means that 99 per cent of ASEAN(5) tariff lines will have tariffs of between 0–5 per cent by 2002.

Items on the SL are to be phased into the IL between 2001–03 and to have tariffs of between 0–5 per cent by 2010. In the modelling we have assumed that SL items are transferred in one hit to the IL in 2010, at which point their CEPT rates are reduced to zero. This assumption may lead to an under or over estimate of benefits from AFTA as:

- items stay on the SL for an additional 7–9 years during which time they receive the MFN rate as opposed to the CEPT rate. Trade liberalisation will be stemmed to some (very small) extent; and
- assuming CEPT rates are reduced to zero may be an over estimate as under AFTA they need only be reduced to between 0–5 per cent by 2010.

However, given the extremely small share of tariff lines on the SL — around 0.4 per cent of tariff lines for the ASEAN(5) — these assumptions will not affect the results to any noticeable extent.

The coverage rates shown above may mask the fact that big-ticket import items are not on the Inclusion List, and hence the ASEAN(5) CEPT coverage rate of 99 per cent of *tariff lines* may over state the value or volume of intra ASEAN trade attracting CEPT rates. As the APG-Cubed model

3.5 **2000 CEPT package**

ASEAN country	*IL*		*TEL*		*SL*		*GEL*		*Total*
	Tariff lines	Share (%)	Tariff lines	Share (%)	Tariff lines	Share (%)	Tariff lines	Share (%)	Tariff lines
Indonesia	6 892	96.4	180	2.5	4	0.1	72	1.0	7 148
Malaysia	8 619	94.9	310	3.4	88	1.0	63	0.7	9 080
Philippines	5 411	94.9	199	3.5	62	1.1	28	0.5	5 700
Singapore	5 781	99.3	0	0.0	0	0.0	38	0.7	5 819
Thailand	8 991	99.5	37	0.4	7	0.1	0	0.0	9 035
ASEAN(5)	35 694	97.0	726	2.0	161	0.4	201	0.5	36 782

Source: ASEAN Secretariat 2000b and CIE calculations.

operates at the highly aggregated six-sector level we are not in a position to differentiate between those products that attract CEPT rates and those that do not. Therefore, coverage rates are used to determine the *share of intra ASEAN trade* attracting the CEPT rate. Intra ASEAN imports not attracting the CEPT rate are assumed to be levied with the appropriate MFN tariff rate.

AFTA-CER liberalisation

This scenario sees CER linking with AFTA. Australia and New Zealand offer preferential entry to ASEAN exports, which is reciprocated by the ASEAN members. We assume that the tariff reduction schedule embarked upon by Australia and New Zealand mirrors that of the ASEAN(5) members. This sees the Australian and New Zealand MFN rates reported in table 3.3 being reduced to between 0–5 per cent by 2002 and to zero by 2005 on exports from ASEAN members. The ASEAN members continue with their CEPT reduction schedule but extend the rates to exports from CER. Exports from non-AFTA-CER economies continue to attract MFN tariff rates.

APEC liberalisation

Under this scenario it is assumed that the APEC Bogor Declaration is adhered to and fulfilled by all APEC economies. This means that the MFN tariff rates specified in table 3.3 are reduced to zero by 2010 for developed APEC economies and by 2020 for developing APEC economies. As APEC embraces the concept of 'open regionalism', all exports to APEC economies — regardless of their source of origin — will enter duty and restriction free.

Appendix B provides greater detail of the scenarios simulated, including the schedule(s) of tariff reductions used to model the various scenarios and CEPT coverage shares by APG-Cubed sector classification for each of the ASEAN(5) members.

4 *Effects on growth, trade and investment flows*

THE RESULTS FOR THE APG-CUBED model of the world economy are reported in this chapter. The implications for each AFTA-CER economy's gross domestic product, sectoral production, investment, real exchange rates and household consumption under the various trade liberalisation scenarios are investigated.

Countries undertake trade liberalisation for a number of reasons — increased competition and the productivity gains this brings, allocative efficiency gains and greater variety in consumption goods and services. Each of these factors contributes to the underlying rationale of pursuing trade liberalisation — to improve the community's economic welfare and standard of living. To decide whether reducing tariffs benefits the community, an appropriate indicator of community welfare needs to be used.

Changes in gross domestic product (GDP) and real consumption are two commonly used measures of changes in economic welfare. In general, changes in GDP reflect only changes in the overall level of economic activity and not changes in welfare or living standards *per se*. In this study, change in real consumption is used as the primary indicator of the welfare gains to consumers from trade liberalisation. The APG-Cubed model takes into account the implications for future consumption arising from the way in which current consumption is financed.

Detailed results for each trade liberalisation scenario are presented in full in appendix C.

Real gross domestic product

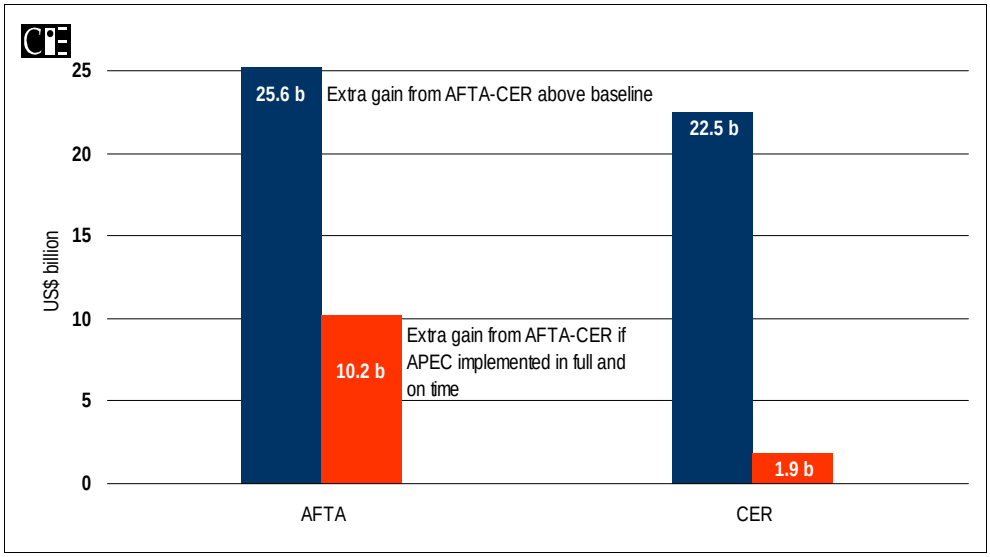
The effect on real GDP following AFTA-CER liberalisation is shown in charts 4.1 and 4.3 and table 4.2. Results in chart 4.3 are expressed as

percentage deviation from the underlying baseline which is 'business-as-usual'.

There are several important observations to be made from the results in chart 4.1 and 4.3 and table 4.2.

1. From chart 4.1 the aggregate gains over time from forming an AFTA-CER free trade area are:
   - AFTA gains US$25.6 billion (on a discounted basis) which amounts to about 0.3 per cent of additional GDP above what it would otherwise be in 2010;
   - CER gains US$22.5 billion in additional GDP on a discounted basis over time or just under an extra 0.3 per cent of GDP in 2010. Of this amount Australia receives US$19.1 billion and New Zealand receives US$3.4 billion.
2. From the table 4.2 it can be seen that all countries gain from AFTA-CER. (The members who joined since ASEAN was formed also gain and the analysis for these countries which is based on a different methodology is discussed in chapter 5.) Indonesia gains more than the others as does the Philippines and Thailand. The reason that Indonesia, Thailand and the Philippines gain more is that they are making larger liberalisations than the other members due to the size of their initial barriers and direction of trade. Singapore's trade, for example, is largely free now except for some barriers to services.

4.1 **Benefits from AFTA-CER** Net present value of additional GDP[a]



[a] GDP discounted using real interest rate of 3 per cent over period 2000–20.

Data source: APG-Cubed model.

4.2 **Gains by member country in GDP by 2010** Percentage deviation from baseline

AFTA[a]	*Per cent*	*CER*	*Per cent*
Indonesia	0.36	Australia	0.25
Malaysia	0.13	New Zealand	0.26
Philippines	0.32		
Singapore	0.08		
Thailand	0.29		
Total	**0.27**	**Total**	**0.25**

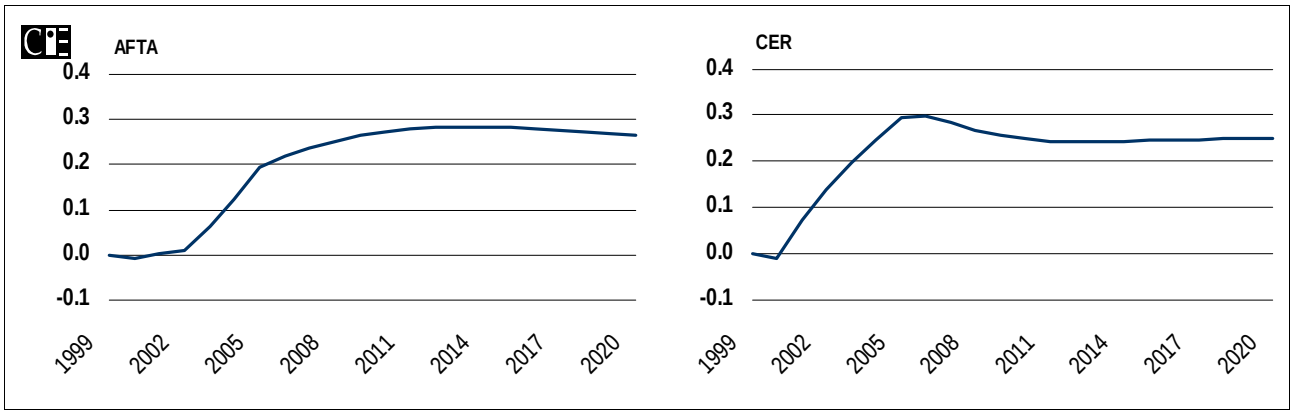
[a] The separate and different analysis for the members who joined ASEAN later is discussed in the next chapter.

Source: APG-Cubed model.

3. The reason why the time profile of GDP shown in chart 4.3 rises gradually over time is that, as typical of all formation of trade groupings of this nature, it is assumed that the liberalisation is being phased in over time. Also, there is a lag before the extra production comes on-stream from the increased investment that occurs as a result of the liberalisation. Besides the fact that physical capital cannot move instantaneously, there are adjustment costs associated with reallocating capital from inefficient protected industries to more efficient industries. Costs of adjustment, which occur in the real world and which are often a source of concern when considering making changes to economic policy such as liberalising trade, are formally allowed for in this analytical model. So the positive effects on national income shown in chart 4.3 are on top of adjustment costs and highlights one of the strengths of the modelling framework used here. There is more investment occurring for AFTA members than for CER and there is also more adjustment so the gains to production for AFTA take a little longer to occur but that is not the case for welfare which is discussed below.

4. The size of the gains from AFTA-CER if the APEC liberalisation goes ahead on schedule as announced under the Bogor Declaration is smaller (chart 4.1). The reason is that some of the trade liberalisation

4.3 **Effects of forming an AFTA-CER FTA on GDP** Percentage deviation of baseline



Data source: APG-cubed model.

that is mooted under AFTA-CER would have occurred under APEC if everything proceeds as announced. AFTA-CER would bring forward many of the gains that would occur under APEC. However, APEC is a voluntary agreement and does not have the legal force that commitments made under the Uruguay Round have. Hence, the choice of the baseline excluding APEC as a 'business-as-usual' scenario. The gains from AFTA-CER are therefore in addition to the Uruguay Round commitments but not in addition to what happens if APEC Bogor goals are met.

Real consumption

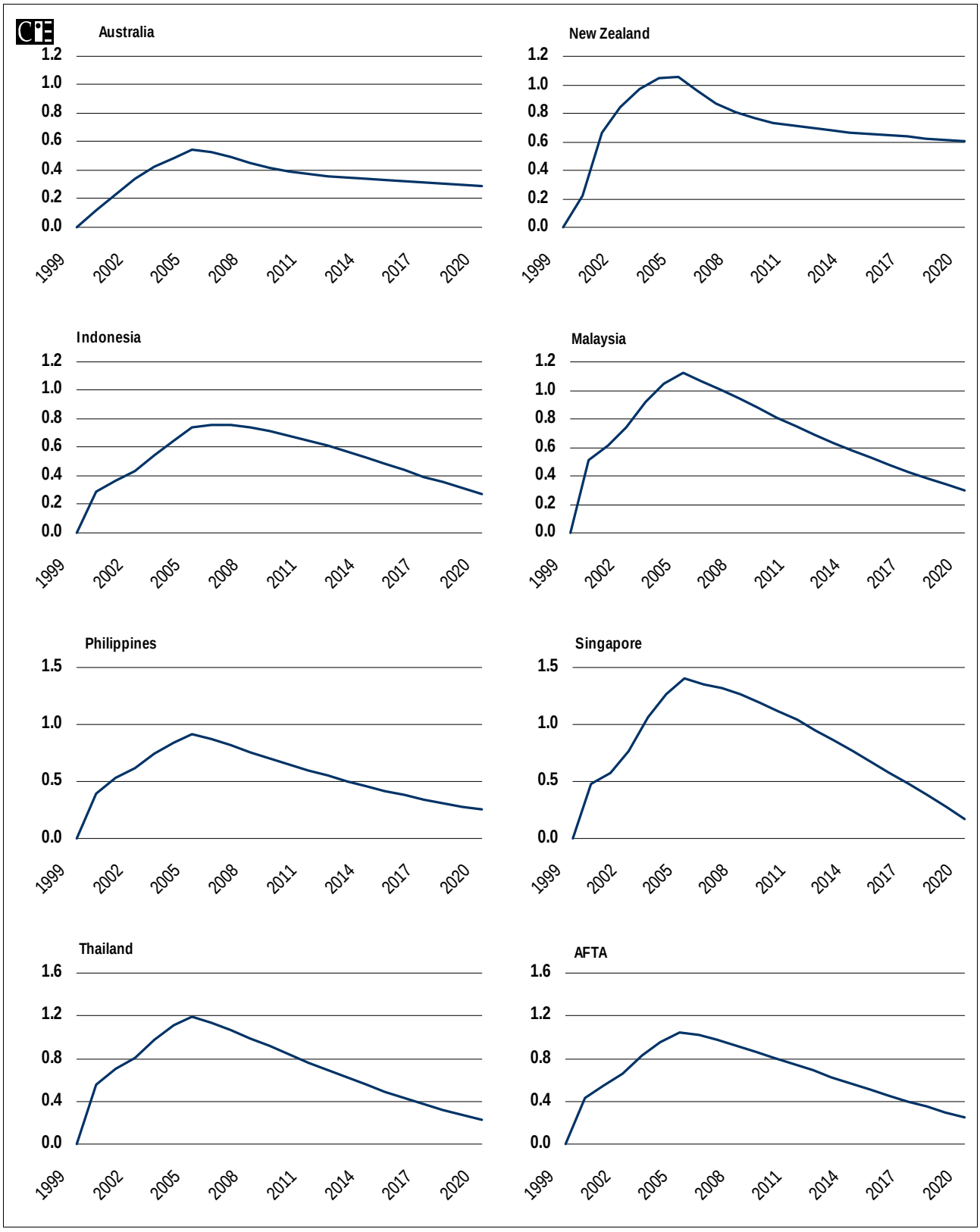
Changes in real household consumption are more indicative of changes in welfare from trade liberalisation than changes in real GDP. Consumption can vary from a country's production by borrowing overseas. In this model consumers are forward looking and can anticipate the extra gain to income as a result of the announced (provided it is credible) tariff reductions.

Chart 4.4 shows that the impact of AFTA-CER on the real welfare of the ASEAN(5) is typically around an additional 1 to 2 per cent above what it might otherwise be by 2005. Whereas Malaysia and Singapore had real GDP gains less than for the other three of the ASEAN(5), now their real welfare gain in relative terms is greater than for Indonesia and the Philippines because they borrow relatively more against their anticipated future wealth.

The impact on welfare for CER is smaller — for Australia, welfare could be 0.5 per cent higher by 2005 and for New Zealand over 1 per cent higher than otherwise by 2005.

The reader might also note the timing difference in benefits for say AFTA by comparing the bottom right hand panel of chart 4.4 with chart 4.3. Real consumption (welfare) rises immediately and much sooner than for production. The reason is that consumption can increase faster than production since consumption can be met by imports and borrowing whereas extra production requires resources to be reallocated and additional investment to occur first — which takes time.

4.4 Effects of AFTA-CER on real consumption



Data source: APG-cubed model.

Investment and capital flows

The trade liberalisation under AFTA-CER causes the more efficient use of resources and improves access to markets. Hence, AFTA-CER lifts productivity and income in each member economy. The improved efficiency and any gains in the terms of trade lifts the return on capital in each economy.

In the global market, funds move to where they can earn the highest returns. So forming the AFTA-CER free trade area causes capital to flow between countries. The net changes in the flow of capital between countries is summarised in table 4.4. A positive change indicates a net flow of capital in to a country. A negative change indicates a net flow out of the country.

Table 4.5 summarises the changes in net capital flows under each scenario for selected points in time.

All of the AFTA-CER economies experience a capital inflow under all scenarios. Of importance is that this inflow is funded principally from the US, Japan and Europe (the largest category of 'other OECD' in table 4.5). These positive capital inflows can be significant and for AFTA the extra capital inflow from AFTA-CER liberalisation amounts to US$30.9 billion over the decade to 2010 (in discounted terms) and for CER the extra capital inflow is $7.7 billion.

The gains for both AFTA and CER from a successful APEC outcome are much greater than just an AFTA-CER link. There are two reasons for this:

- trade between AFTA and CER is small in comparison with trade with APEC; and
- APEC represents a much more extensive liberalisation — it covers all imports. Remember that APEC liberalisation is on an open regionalism basis — that is, countries offer APEC tariff cuts on an MFN basis. The AFTA-CER free trade area liberalises trade between members but not with third countries. APEC is really a 'series of simultaneous unilateral MFN liberalisations' by a group of twenty-one countries.

These capital flows are a result of expected changes in the marginal productivity of capital in the AFTA-CER economies as they liberalise. Thus, for example, capital flows from the United States because it can earn a higher return from the liberalising AFTA-CER economies.

4.5 **Net capital inflows** US$billion

Economy	*2000*	*2004*	*2008*	*2012*	*2016*	*2020*
AFTA-CER only						
United States	-0.66	-1.03	-1.19	-1.21	-1.19	-1.14
Japan	-0.35	-0.80	-0.97	-0.95	-0.88	-0.79
Australia	0.37	0.69	0.65	0.60	0.60	0.62
New Zealand	0.13	0.24	0.18	0.17	0.18	0.20
Indonesia	0.35	0.73	0.93	0.92	0.81	0.67
Malaysia	0.27	0.55	0.67	0.68	0.68	0.69
Philippines	0.17	0.40	0.46	0.45	0.42	0.39
Singapore	0.31	0.79	1.04	1.06	0.99	0.87
Thailand	0.48	0.94	1.07	1.00	0.90	0.81
China	-0.06	-0.20	-0.23	-0.19	-0.13	-0.06
India	-0.03	-0.07	-0.08	-0.08	-0.07	-0.06
Chinese Taipei	-0.10	-0.18	-0.13	-0.04	0.04	0.10
Republic of Korea	-0.06	-0.16	-0.15	-0.11	-0.08	-0.05
Hong Kong, China	-0.06	-0.05	-0.01	0.01	0.02	0.03
Other OECD	-0.62	-1.69	-2.23	-2.35	-2.36	-2.32
APEC only						
United States	-24.64	-27.83	-27.61	-28.57	-32.46	-34.18
Japan	-5.78	-8.62	-12.22	-15.15	-18.69	-19.67
Australia	1.09	2.77	3.72	3.73	3.08	3.05
New Zealand	1.19	1.10	0.68	0.25	0.15	0.14
Indonesia	5.75	9.07	12.45	15.55	17.57	18.56
Malaysia	3.85	7.14	10.37	12.83	15.03	16.66
Philippines	1.48	2.96	4.37	5.68	6.84	7.65
Singapore	2.70	6.76	11.21	13.29	13.39	12.63
Thailand	6.01	10.45	14.72	18.73	21.96	23.80
China	-1.31	4.94	11.32	19.34	29.30	38.22
India	-0.87	-1.56	-2.26	-2.70	-2.95	-3.06
Chinese Taipei	11.43	23.04	32.41	34.63	34.77	34.98
Republic of Korea	0.60	2.27	3.54	4.52	5.03	5.73
Hong Kong, China	25.51	17.62	13.27	11.86	12.48	12.38
Other OECD	-21.51	-46.80	-73.45	-92.92	-105.32	-116.81
AFTA-CER and APEC						
United States	-25.00	-28.34	-28.21	-29.23	-33.11	-34.83
Japan	-6.29	-9.33	-12.94	-15.82	-19.27	-20.15
Australia	1.06	2.71	3.59	3.57	2.96	2.98
New Zealand	1.34	1.18	0.61	0.18	0.08	0.10
Indonesia	6.00	9.55	12.96	15.95	17.78	18.58
Malaysia	4.55	8.14	11.44	13.88	16.03	17.62
Philippines	1.53	3.05	4.44	5.72	6.84	7.62
Singapore	3.96	8.29	12.88	14.95	14.94	14.03
Thailand	6.25	10.84	15.12	19.07	22.23	24.00
China	-1.48	4.72	11.12	19.19	29.20	38.18
India	-0.92	-1.63	-2.33	-2.75	-2.99	-3.09
Chinese Taipei	11.22	22.86	32.32	34.63	34.85	35.12
Republic of Korea	0.49	2.14	3.43	4.45	4.99	5.71
Hong Kong, China	25.55	17.61	13.26	11.86	12.50	12.41
Other OECD	-22.51	-48.37	-75.18	-94.61	-106.90	-118.24

Source: APG-Cubed model.

AFTA-CER economies benefit from these capital flows, which allow an increase in investment, production and consumption. While these capital flows represent an increase in the current account deficit they also reflect the increased attractiveness of investment in these countries. They show the movement of capital to each economy, allowing residents to increase their consumption and investment without impacting on domestic savings. The fact that any additional current account deficit implies payments to foreign investors has already been accounted for in the modelling framework.

The extra foreign investment adds to extra domestic investment causing total investment in each economy to rise. The pattern of investment over time is shown in chart 4.6. Typically, investment rises by 0.5 per cent above what it would otherwise be and the investment boost tapers off over time as additional capital restores the marginal return to capital to its previous level.

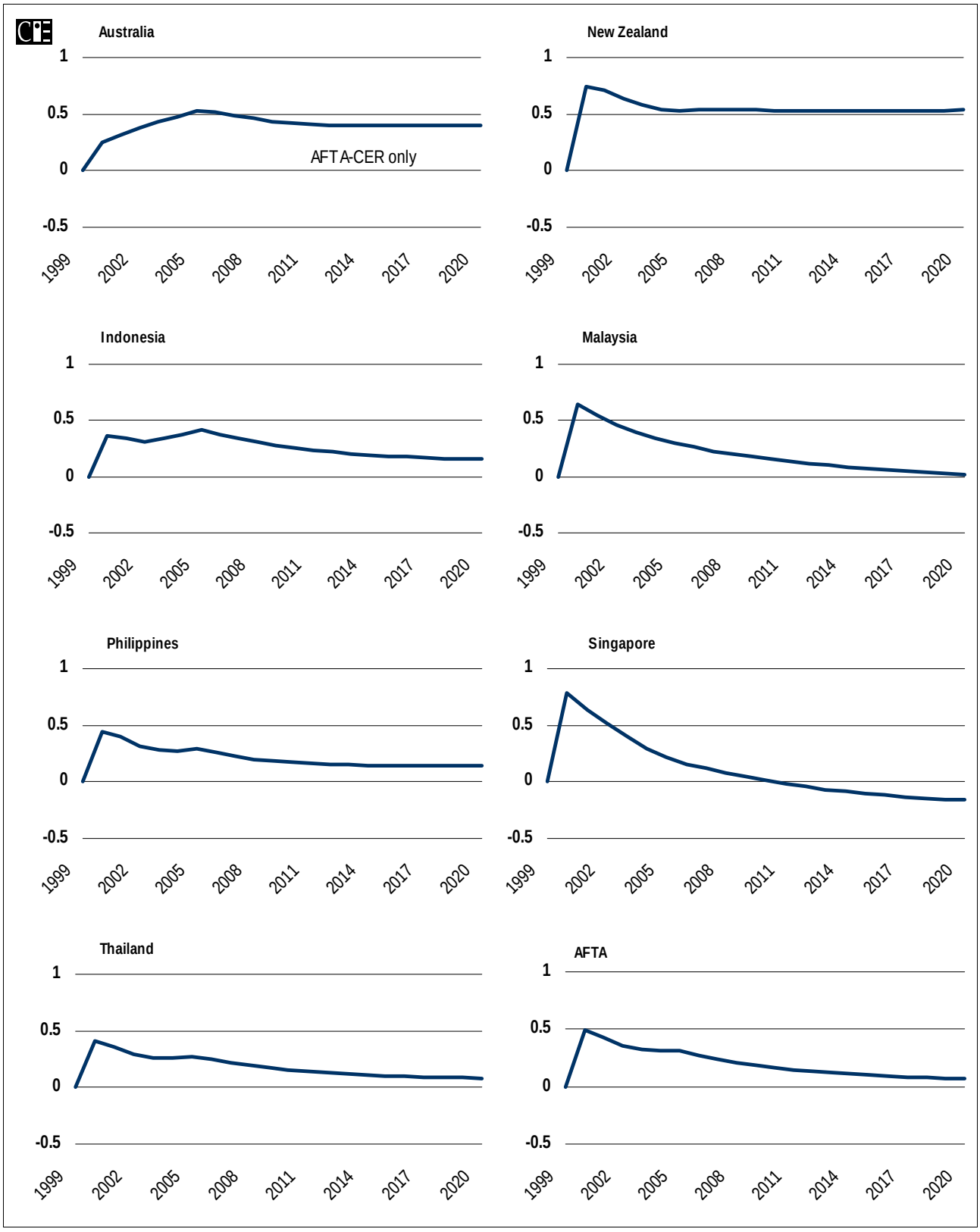
Real exchange rates

As seen above, trade liberalisation increases productivity in the economy. One effect is to cause an increase in the return to capital in each economy. Higher returns to capital encourages investment, part of which will come from foreign capital inflow. The consequence is that the real exchange rate appreciates for each economy vis-à-vis the US$. These appreciations are shown in chart 4.7. The appreciations are modest — around 0.5 to 0.8 per cent above baseline for the five founding ASEAN members at the peak (around 2005) and 0.4 per cent for Australia and 1.2 per cent for New Zealand. Once the foreign investment has occurred, the exchange rate weakens so that exports are encouraged over imports and the current account moves towards surplus (or lower deficit) to service the foreign investment.

Sectoral changes in production

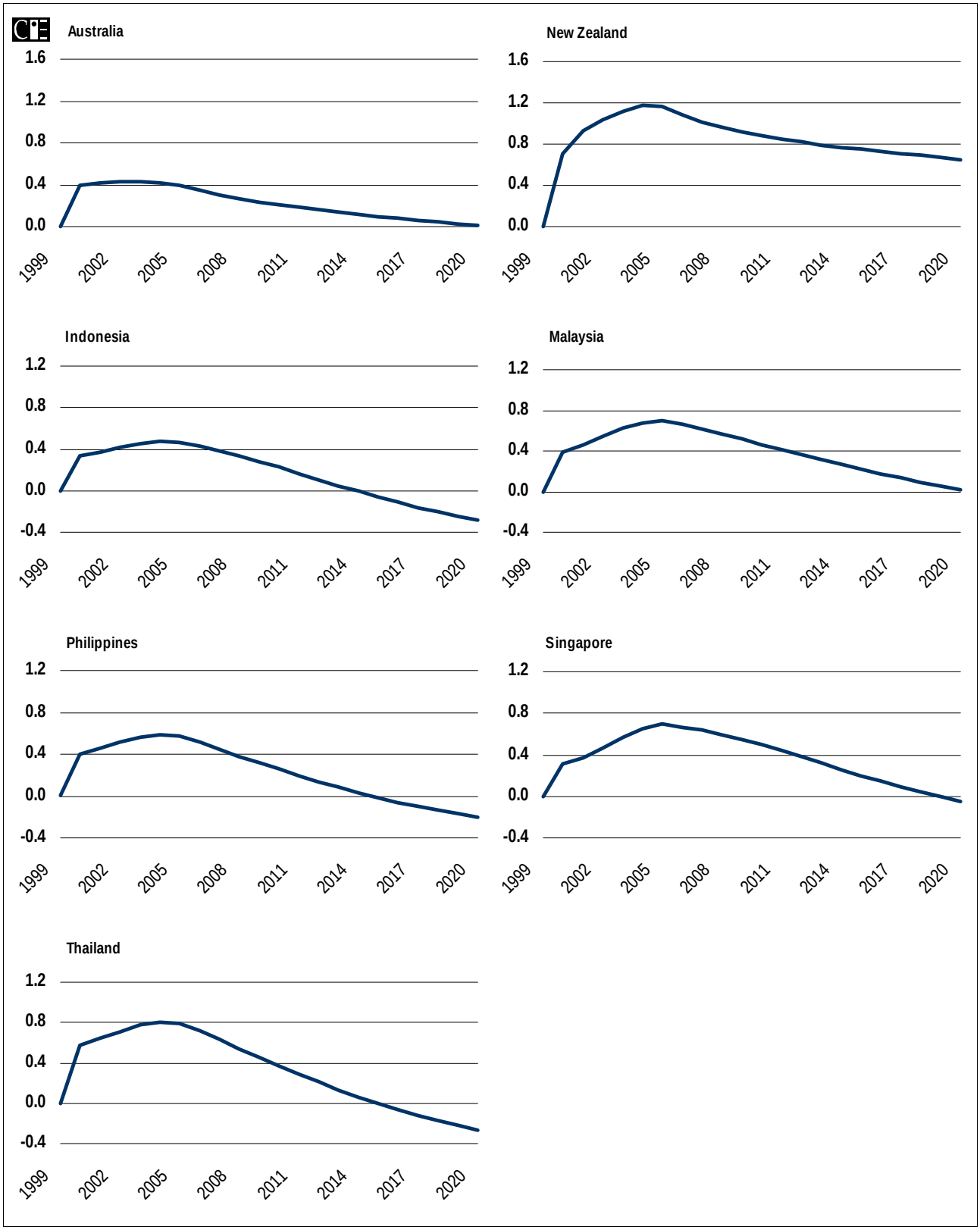
The extra investment in each economy discussed earlier causes production to rise and exports to change. This production increase is different across sectors due to different levels of protection being removed across sectors and different demands for domestically produced goods. At the level of aggregation for sectors used here, some output of each sector would be used for investment goods but there would be large differences across

4.6 **Effects of AFTA-CER on investment** Percentage deviation from baseline



Data source: APG-cubed model.

4.7 **Effects of AFTA-CER on real exchange rates** Percentage deviation from baseline



Data source: APG-cubed model.

sectors — durable manufactured goods such as motor vehicles are an obvious category where there is a large investment good component. The production increases across the six different sectors is shown in chart 4.8.

The largest absolute increase in production occurs in the services sectors for both CER and AFTA. But this happens because services comprise such a large proportion of the economy for each member. In relative (proportional) terms the largest increases in production are in agriculture and both durable and non-durable manufacturing. For CER a significant proportion of non-durable manufacturing would comprise processed food such as dairy products, sugar and beef. Durable production rises partly because this category comprises investment goods that are in higher demand as a result of the higher levels of efficiency upon liberalising trade.

Note that there are three extra demands for domestic production when countries form a free trade area as set out in the following identity.

Domestic production	= Export demand	+ Investment demand for domestically produced goods	+ Final consumption demand for domestically produced goods

Some investment demand will be met by imports as will some final consumption demand, but much of the extra investment demand and final consumption will be from domestically produced goods. All three demands — exports, investment and final consumption rise initially upon forming the free trade area. But since domestic production is constrained by how quickly new investment can occur, there will be a substitution towards imports and some of the production previously destined for export markets will be diverted to the home market. The mechanism by which this occurs is the appreciation of the real exchange rate for each country as discussed earlier. This appreciation provides the price signal for producers to initially divert production away from export markets to the domestic market to meet the extra investment and final consumption demand. Of course, once the new investment is in place production eventually rises and since there is no extra demand for foreign capital the real exchange rate falls. Hence exports start to rise after their initial temporary drop.

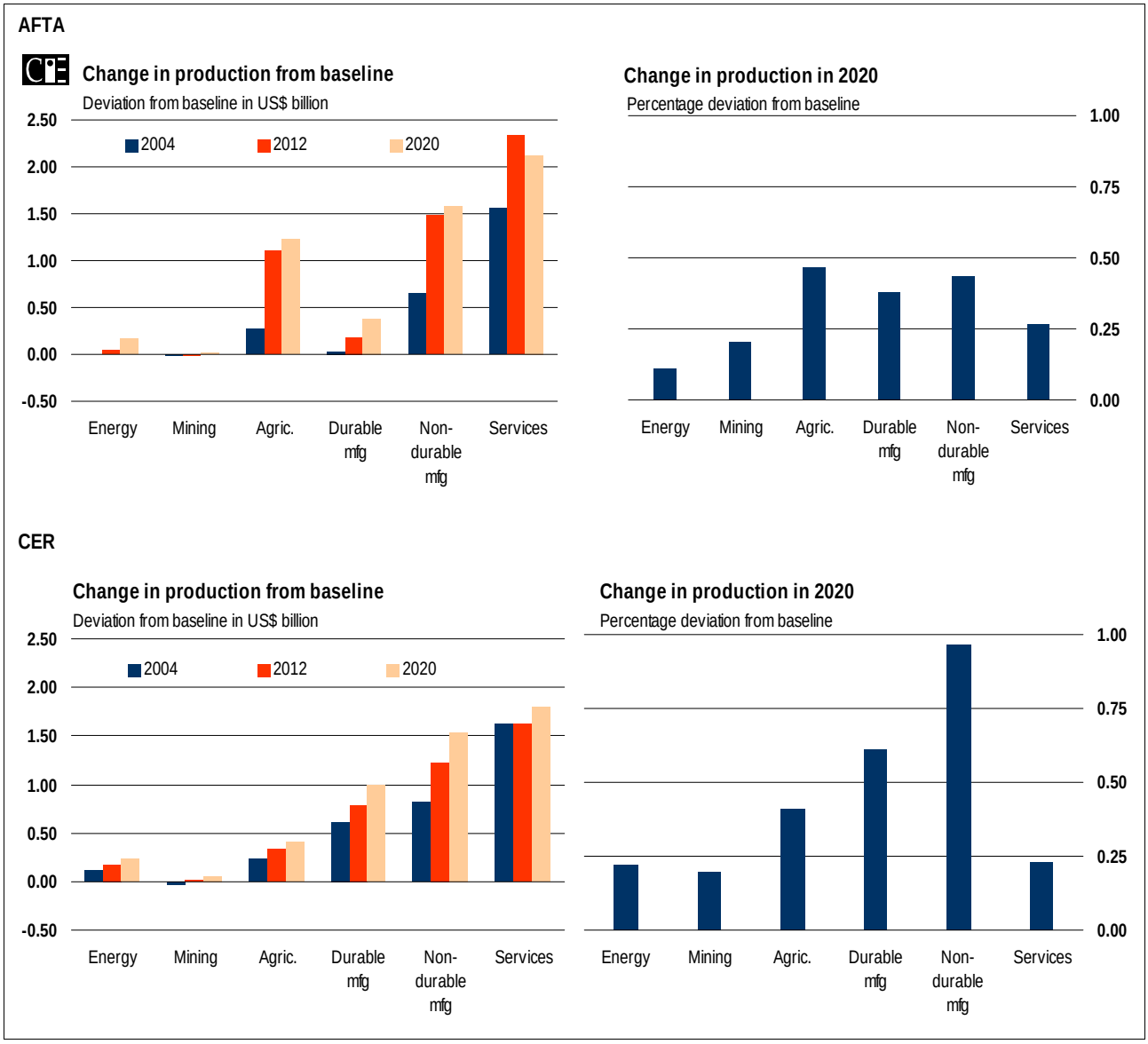
The key point is that with the beneficial new capital inflow there has to be a commensurate change in the current account towards deficit as seen earlier. This is necessary to balance the external accounts. For the current account to move towards deficit there has to be some combination of initial increase in imports and/or decrease in exports. There is nothing untoward in this — it is simply the way countries can avail themselves of the beneficial foreign

investment and the necessity to initially divert a small amount of export production to meet the higher domestic requirements.

After a period, exports rise above what they would otherwise have been and this is necessary for countries to service the extra foreign investment.

Were this foreign investment not allowed, there would be less impact on the real exchange rate but there would be far less extra production and less income generated by forming the free trade area.

4.8 **Effects of AFTA-CER on the sectoral composition of production**



Data source: APG-Cubed model.

5 *Estimating the benefits of liberalisation for other ASEAN members*

THE ANALYSIS OF THE EFFECTS of trade liberalisation presented in the previous chapter excluded the effects of liberalisation on the 'newer' ASEAN members of Brunei Darussalam, Cambodia, Lao PDR, Myanmar and Vietnam. Like all economywide models, the APG-Cubed model is extremely data intensive. The very limited data availability for the newer ASEAN members means that they cannot, as yet, be explicitly incorporated into the APG-Cubed model. To estimate the implications for the newer ASEAN members of the various trade liberalisation scenarios an alternative methodology has been used.

Overview of newer ASEAN members

Table 5.1 provides a broad overview of the newer ASEAN members and their interaction with other economies. The newer ASEAN members have a combined GDP of around US$39 billion. By way of comparison, the Philippines, which has the smallest GPD of ASEAN(5) members, is around twice the size of the combined newer ASEAN members.

5.1 **Newer ASEAN members**

ASEAN member					*Average tariff rate*	
	Population	***GDP***	***Exports***	***Imports***	***CEPT[a]***	***MFN[b]***
	Million	US$ million	US$ million	US$ million	Per cent	Per cent
Brunei Darussalam	0.3	4 934	3 200	2 000	1.1	3.0
Cambodia	11.4	3 213	429	845	Na	14.9
Lao PDR	5.4	1 823	476	802	Na	14.7
Myanmar	47.3	3 400	1 609	3 099	Na	5.8
Vietnam	78.1	25 718	11 510	14 173	2.1	19.0

a Simple average. **b** Weighted average except for Myanmar and Brunei (which are simple averages).

Source: IMF 1999 and 2000, Fukase and Martin 1999a, 1999b and 1999c, Robertson and Pohoresky 1997, DFAT 1999b, WTO 1999 and ASEAN Secretariat 1999b.

Factors influencing the magnitude of gains

It has been well documented that trade liberalisation is associated with economic gains — improved resource allocation (allocative efficiency), endogenous productivity gains, increased competition and an increased range of products available to consumers at a lower price. The extent to which these benefits accrue to economies, and the magnitude thereof, depends on three principle drivers.

Extent of trading with CER economies

The fall in price of CER imports will increase the volume of imports from CER economies (trade creation), which is welfare improving. The greater the extent of trade with CER members, the greater the trade that will (eventually) be free and the greater the trade creating effects. To some extent, this will be counter balanced by the trade diversion effect as newer ASEAN members substitute between imports from the rest of the world (still attracting tariffs) to CER imports (reduced tariffs). In addition, the gains resulting from trade creation are partially offset by the decreasing tax revenue from import duties although expansion of the domestic economy will mean extra tax receipts. How the balance of these two effects ends up depends on the tax mix in place, the level of duties, the amount of trade and so on, but any short fall will need to be made up elsewhere if government funding is to remain unchanged.

On the export side, liberalisation by trading partners provides newer ASEAN producers with greater market access and raises the price received by those producers who export to partner economies. Terms of trade will improve as a consequence. Table 5.2 shows the extent of the newer ASEAN members' trade with CER. From table 5.2 it can be seen that, with the exception of Vietnam, the newer ASEAN members do not trade extensively with CER economies.

5.2 **Newer ASEAN members trade with CER**

ASEAN member	*Share of trade with CER economies*		
	Exports	*Imports*	*Total trade*
	Per cent	Per cent	Per cent
Brunei Darussalam	0.70	1.50	1.01
Cambodia	0.16	0.53	0.41
Lao PDR	0.00	0.37	0.23
Myanmar	0.50	0.26	0.34
Vietnam	5.00	1.30	2.96

Source: WTO 1999 and CIE calculations.

Size of current trade barriers

The current level of MFN tariffs imposed by the newer ASEAN members will in part determine the gains from trade liberalisation. If MFN tariff rates are already low, as is the case with Brunei Darussalam and Myanmar, then the marginal benefits of reducing tariffs and extending AFTA to include the CER economies are relatively small.

Liberalisation time frame

The pace and scope of tariff liberalisation under the CEPT scheme is determined by the tariff lines placed by ASEAN members on the Inclusion, Temporary Exclusion, Sensitive and General Exclusion Lists. As countries are able to nominate which tariff lines are included on which lists, AFTA membership does not necessarily ensure free trade and large benefits. Gains from participation in AFTA will depend on the scope of products included on the Inclusion List. For example, in quantifying Vietnam's accession to AFTA, Fukase and Martin (1999a) note that the exclusion of a range of products from AFTA commitments appears to limit the scope for trade creation.

As noted in chapter 2, the newer ASEAN members (with the exception of Brunei Darussalam) have a more relaxed time frame of trade liberalisation. The newer members of Lao PDR, Myanmar and Vietnam have undertaken to maximise the number of tariff lines in the 0–5 per cent range by 2003 for Vietnam and 2005 for Lao PDR and Myanmar; and expand the number of tariff lines in the zero per cent category by 2006 for Vietnam and by 2008 for Lao PDR and Myanmar. Details on Cambodia's commitments under AFTA are not available.

Table 5.3 details the number of tariff lines that the newer ASEAN members have allocated to the various CEPT scheme lists. From table 5.3 it can be seen that the newer ASEAN member's commitment to AFTA is varied. Broadly speaking, the greater the pace at which tariff lines are transferred to the Inclusion List and the greater the rate of tariff reduction, the sooner and the larger the benefits that will accrue to the newer ASEAN members.

Whether trade liberalisation improves or reduces a country's welfare depends on which of the trade creation or trade diversion effects is dominant. In summary, the gains from trade liberalisation will be larger:

- the higher the rate of protection initially applied;

5.3 **Newer ASEAN members 2000 CEPT packages**

ASEAN country	*IL*		*TEL*		*SL*		*GEL*		*Total*
	Tariff lines	Share (%)	Tariff lines	Share (%)	Tariff lines	Share (%)	Tariff lines	Share (%)	Tariff lines
Brunei Darussalam	6 226	96.6	0	0.0	14	0.2	202	3.1	6 442
Cambodia	3 109	45.6	3 523	51.7	50	0.7	134	2.0	6 816
Lao PDR	1 247	35.1	2 126	59.9	88	2.5	90	2.5	3 551
Myanmar	2 332	42.8	2 987	54.8	21	0.4	108	2.0	5 448
Vietnam	3 573	74.1	1 007	20.9	48	1.0	196	4.1	4 824
Newer ASEAN members	16 487	60.9	9 643	35.6	221	0.8	730	2.7	27 081

Source: ASEAN Secretariat 2000b and CIE calculations.

- the more price responsive domestic demand is for traded goods (particularly, the more substitutable are domestic and imported goods); and
- the greater the extent of trade with members of the free trade area.

Trade diversion is likely to be greater:

- the higher the tariffs applied to imports from countries outside the free trade area; and
- the larger the reduction in imports from economies outside the FTA (particularly, the greater the substitutability between imports from different sources of origin).

The negative effects of any trade diversion can be eliminated if the newer ASEAN members liberalise tariffs on imports from all trading nations (that is, reduce MFN tariff rates). The negative welfare effects of trade diversion only arise when tariffs are liberalised on a preferential basis.

Methodology

The methodology to calculate the additional (GDP) gains for the newer ASEAN members from extending AFTA to include the CER economies is set out in appendix D. Only a partial estimate has been made to see what order of magnitude might results.

Due to the 'back of the envelope', nature of this calculation, and the paucity of data, the results generated should be taken as *indicators* of the magnitude of likely benefits arising from an AFTA-CER link rather than forecasts of benefits.

Estimated gains from trade liberalisation

Table 5.4 shows the estimated benefits accruing to the newer ASEAN members from extending AFTA to include the CER economies. The newer

ASEAN members will experience direct and indirect sources of GDP gain. With respect to the former, GDP gains will arise through export promotion (as their exports are now cheaper to CER economies) and tariff reduction (as imports from CER are now cheaper). Indirect benefits will accrue as a result of the ASEAN(5) members growing following inclusion of CER in AFTA. In chapter 4 we saw that, on average, ASEAN(5) members experience an around 0.25 per cent increase in GDP in 2020. As these economies grow so too will their demand for imports, including imports from the newer ASEAN members.

Due to the (often extensive) trade between ASEAN members, what is good for the ASEAN(5) is good for the newer ASEAN members. That is, for the smaller ASEAN economies of Brunei Darussalam, Cambodia, Lao PDR and Myanmar, where trade with CER is small, the indirect gains from having a beneficial change to their ASEAN trading partners is a significant source of gain from the AFTA-CER link.

For most of the newer ASEAN members the additional GDP gain arising from the CER link is quite small. This is reconcilable with the amount of trade between CER and the newer ASEAN members. For example, official statistics show no exports from Lao PDR to CER, and only 0.37 per cent of Lao PDR imports are sourced from CER economies. This means that Lao PDR does not stand to benefit from additional export returns, and benefits from cheaper imports will be limited due to the small amount of imports sourced from CER economies. Broadly speaking, there is a direct relationship between the amount of trade with CER economies and GDP gains (compare tables 5.2 and 5.4) — the greater the trade and MFN tariff rate, the greater the GDP gain. While official statistics show trade with CER for some of the newer ASEAN members to be small, the purpose of AFTA-CER is to establish closer links and build trade, which would lead to larger gains.

5.4 **Composition of GDP gain from extending AFTA membership to CER**

ASEAN member	*Direct GDP gain*		*Indirect GDP gain*	*Total GDP gain*[a]
	MFN reduction	*Export returns*		
	Per cent	Per cent	Per cent	Per cent
Brunei Darussalam	0.02	0.04	0.04	0.10
Cambodia	0.03	0.01	0.02	0.07
Lao PDR	0.02	0.00	0.04	0.07
Myanmar	0.01	0.03	0.05	0.09
Vietnam	0.09	0.32	0.03	0.44

[a] Numbers may not add due to rounding.

Source: CIE calculations

Vietnam experiences the largest GDP gain by virtue of its relatively large share of trade with CER economies (5 per cent of exports and 1.3 per cent of imports) and its high MFN tariff rate.

The indirect gain is a factor of the share of exports going to ASEAN(5) members, the importance of exports in GDP and the average GDP gain of ASEAN(5) members. Because of extensive trade with the ASEAN(5), for some of the newer ASEAN members the indirect GDP gain is larger than the direct gain. For example, around 65 per cent of Lao PDR exports are to ASEAN(5) and exports account for around 26 per cent of GDP, meaning that Lao PDR is likely to experience relatively large indirect benefits from extending AFTA to include CER.

It is likely that the GDP gains reported in table 5.4 understate the gains from extending AFTA membership to Australia and New Zealand. Following the success of CER, Australia and New Zealand may be able to offer expertise in advancing service liberalisation and removal of non-tariff barriers. Non-tariff barriers have been found to be a significant source of inefficiency within an economy, and their removal is linked to correspondingly large GDP gains.

For example, in the case of Vietnam, there has been more analysis on barriers to trade than for the other ASEAN members analysed in this section of the report (for example, see IMF 1999, CIE 1998 and 1999). These studies show that non-tariff barriers are significant and reflect the ongoing legacy of state trading. These non-tariff barriers are far more important than the MFN tariff rate. Typically, these non-tariff barriers can be three times more important than for formal border tariffs (see for example CIE 1997). If these non-tariff barriers are three times as significant as tariff barriers in Vietnam, the gain in GDP from extending AFTA to include CER economies could be significantly higher. However, until these non-tariff barriers are quantified it is difficult to be more precise.

6 *Concluding comments*

THE ECONOMIC BENEFITS from an AFTA-CER FTA over time have been estimated to be worth US$48.1 billion of additional GDP discounted back to the year 2000.

In another sense, however, the gains from an AFTA-CER FTA could be much greater than estimated here based on the following logic. A successful AFTA-CER FTA would signal a greater willingness to liberalise trade by nine members of APEC. To that extent, AFTA-CER FTA would complement initiatives to liberalise trade in an APEC context. After all, the gains from an APEC liberalisation are estimated to be very large. The argument could be mounted that AFTA-CER FTA could actually encourage, in part, a more successful outcome from the APEC Bogor Declaration than otherwise might be achieved. It was seen earlier how the beneficial effects of CER has led New Zealand to extend its liberalisation of trade beyond that of Australia. If forming AFTA-CER did have the effect of encouraging more liberalisation, some proportion of the large gains from APEC liberalisation could be attributable to AFTA-CER FTA. Just how big that could be is difficult to say — it would depend on the degree to which the above line of reasoning was accepted and how much AFTA-CER FTA contributes to further APEC liberalisation.

Two other observations are worth noting relevant to the above argument. If AFTA-CER FTA is worthwhile, not just in its own right but because of its complementarity to APEC and other WTO multilateral initiatives, then an earlier establishment of the FTA is far preferable to a later one. The second observation is that the additional gains from an AFTA-CER FTA link if APEC is likely to be wholly successful comes from the slightly faster pace of liberalisation than under APEC. Although the timeframe, scope and institutional arrangements for the proposed FTA are still being evaluated by the AFTA-CER Task Force, the liberalisation timeframe adopted in this study in estimating these benefits is 2005. If 2010 is the timeframe adopted and if APEC proceeds in large part as announced, there would be very limited additional gain from the AFTA-CER FTA. An earlier timeframe will yield larger benefits than a later one for AFTA-CER.

This analysis has extended the earlier 1997 study by including services and endogenous productivity. Also, data have been updated and some approximation of the benefits for the five later entrants to ASEAN that could not be included in the formal modelling has been included. The inclusion of services and endogenous productivity as a result of liberalisation leads to significantly higher benefits than measured in 1997. The size of the benefits are three times those estimated in the 1997 study. Services become a large component of the economy as a country grows and prospers and gains to productivity stand to lift income substantially. However, the caveat on the paucity of data on barriers to trade in services has been noted in this study. Further work in this area is still required.

Finally, this study has concentrated on the measurable economic gains from forming an AFTA-CER FTA. These benefits are net benefits — they consider the balance of trade creation and trade diversion and the model fully accounts for adjustment costs. All countries were seen to gain from the FTA. Other gains, such as the gains that naturally follow from better economic and cultural linkages and closer integration, would have been captured only in part in the productivity enhancing effects due to the historical parameters used in the estimates. These benefits arise from the greater contact, trust, networking and confidence in business relationships that would follow. Also, to the extent that AFTA-CER FTA engenders a climate of liberalisation for a significant region and number of countries, so it may be complementary to other initiatives, such as within APEC and the WTO, to liberalise world trade.

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Appendixes

A The APG-cubed model

THE G-CUBED (ASIA PACIFIC) MODEL emerged from a research program designed to link two strands of quantitative economic modelling:

- traditional multisectoral general equilibrium models — which capture interactions between sectors but which are often static, do not generally incorporate the financial sector and do not have full macroeconomic closure; and
- macroeconomic models — which are mostly dynamic and have full macroeconomic closure but which usually do not capture intersectoral interactions and often do not have a well-specified supply side.

Origins of G-Cubed (Asia Pacific) model

The origins of G-Cubed (Asia Pacific) are the MSG2 macroeconomic model (McKibbin and Sachs 1991) and the G-Cubed model. Both of these models have proved successful in a wide variety of applications. The G-Cubed model has been an important tool in analysing greenhouse gas policy in the global economy (McKibbin and Wilcoxen 1998).

Several features of G-Cubed (Asia Pacific) make it an ideal tool for analysing the effects of trade liberalisation with endogenous productivity and risk premiums.

- With its macroeconomic detail, and integrated real and financial markets, G-Cubed (Asia Pacific) can account for the effects of a financial shock on interest rates, exchange rates and international capital movements. It can also account for the effects of different government fiscal and monetary responses to these shocks. The model fully integrates wealth effects on consumption and captures debt burdens and expectations.
- With its explicit treatment of expectations, G-Cubed (Asia Pacific) can account for the ways in which future policy changes that are credible can affect economic activity in the early stages of implementation.

- As a global general equilibrium model, G-Cubed (Asia Pacific) accounts for the interactions between sectors and between regions. Thus, it can capture the effects of policy changes and shocks within an economy and between economies.
- As a dynamic model, G-Cubed (Asia Pacific) can account explicitly for the time paths of policies and shocks.

By contrast, the comparative-static modelling frameworks used in traditional computable general equilibrium models do not include treatment of dynamics, interest rates, expectations or capital movements.

Country to industry coverage

G-Cubed (Asia Pacific) separately identifies 18 countries / regions. Table A1 sets out the economy and six sector coverage of the version of G-Cubed (Asia Pacific) used in this study. Some food items occur in non-durable manufacturing, and the mapping between G-Cubed (Asia Pacific) and SIC sectors is shown in table A2.

A.1 **Economy and industry coverage of G-Cubed (Asia Pacific)**

Economies		***Sectors***
United States	China	Energy
Japan	Chinese Taipei	Mining
Australia	Korea	Agriculture
New Zealand	Hong Kong	Durable Manufacturing
Indonesia	India	Non-durable manufacturing
Malaysia		Services
Philippines		
Singapore		
Thailand		
Other OECD		

Key features

Detailed specifications of the theoretical structure of G-Cubed (Asia Pacific) can be found in McKibbin (1996). The key features of G-Cubed (Asia Pacific) are that it:

- specifies the demand and supply sides of industrialised economies;
- integrates the real and financial markets of these economies;
- fully accounts for stocks and flows of real resources and financial assets;

A.2 **Relationship between G-Cubed (Asia Pacific) and SIC sectors for agriculture and non-durable manufacturing**

G-Cubed (Asia Pacific)	*SIC code*	
Agriculture	01	Agricultural production — crops (excluding cereal preparations and flour)
	02	Agricultural production — livestock and animal specialities
	07	Agricultural services
	08	Forestry
	09	Fishing, hunting, and trapping
	24	Lumber
Non-durable manufacturing	20	Food and kindred products (including cereal preparations and flour)
	21	Tobacco products
	22	Textile mill products
	23	Apparel and other finished products made
	26	Paper and allied products
	27	Printing, publishing and allied industries
	28	Chemical and allied products
	30	Rubber and miscellaneous plastics products

- imposes intertemporal budget constraints so that agents and countries cannot indefinitely borrow and lend without undertaking the resource transfers necessary to service outstanding liabilities;
- has short run behaviour that is a weighted average of neoclassical optimising behaviour and liquidity constrained behaviour;
- has a real side that is disaggregated to allow for production and trade of multiple goods and services within and between economies;
- has full short and long run macroeconomic closure with annual macrodynamics around a neoclassical growth model; and
- can be solved for the full rational expectations equilibrium annually from 1996 to 2100.

Like other models, G-Cubed (Asia Pacific) essentially consists of a theoretical framework, data and parameters.

Theory

The model theory consists of behavioural and accounting relationships. The model recognises a number of economic agents including firms, households and government.

Firms

Each sector is represented by a firm, which chooses its inputs and level of investment so as to maximise its stockmarket value, subject to a multiple input production function and output prices (which are given as far as the firm is concerned).

Sectoral output is produced using capital, labour, energy and materials. Energy and materials are aggregates of inputs of intermediate goods, which are in turn aggregates of imported and domestic commodities that are assumed to be imperfect substitutes.

The capital stock in each sector changes according to the rate of fixed capital formation and the rate of depreciation. Investment is subject to rising marginal installation costs so that total real investment is the value of purchases plus the per unit cost of installation. The per unit cost is a function of the rate of investment. This implies that, once in place, it is costly to move physical capital between sectors. In contrast, financial capital is perfectly mobile.

The goal of each firm is to choose its inputs to maximise intertemporal net (of tax) profits. Taxes included are a corporate income tax, taxes on inputs (such as a carbon tax) and an investment tax credit.

Wages

Wages are determined by assuming that labour is mobile between sectors in each region, but not between regions. Thus, each sector in a region pays the same wages. Wages in a particular country adjust according to an overlapping contracts model where nominal wages depend on current and expected inflation and on labour demand relative to labour supply. Long run labour supply is determined by the (exogenous) rate of population growth. In the short run, hours worked can fluctuate. For a given nominal wage the demand for labour determines short run unemployment in each sector. This varies, depending on the composition of demand for each sector's output.

Households

Household behaviour is assumed to be a weighted average of two types of behaviour. In the first, households aim to maximise intertemporal utility subject to a wealth constraint. Wealth consists of human wealth and financial assets. Human wealth is the present value of the expected future stream of after-tax labour income. Financial wealth is the sum of real

money balances, real government bonds, net claims against foreigners and the value of capital in each sector.

In the second type of behaviour, households base their consumption on after-tax current income.

Government

Real government spending is exogenous and constant as a share of GDP. Government consumption is financed by taxes (corporate and personal income taxes) and by issuing government debt.

The government budget must balance in present value terms but need not balance in any single period. Thus, if the government runs a budget deficit today, it must run an appropriate budget surplus at some point in the future. If not, the government will be unable to pay interest on debt and private agents will not be willing to hold it. The specific fiscal closure chosen is that at every instant in time the government must levy a lump sum tax equal to the value of interest payments on the outstanding debt.

Financial markets and balance of payments

The model accounts for flows of assets between regions, consistent with the flows of goods. The model specifies that money is required to undertake transactions and so the demand for money is a function of GDP and short term nominal interest rates. The supply of money is exogenously chosen by the central bank in each region.

Asset markets are assumed to be integrated across regions. The model allows for risk premiums on assets held in different currencies. These are calculated as part of the baseline of the model and are designed to replicate 1996. When undertaking simulations it is assumed that risk premiums are independent of the shock under consideration.

For the results reported in this paper, exchange rates are assumed to be floating. Also, it is assumed that OPEC (Organisation of Petroleum Exporting Countries) chooses its foreign lending in order to maintain a desired ratio of income to wealth and that Eastern Europe and the former Soviet Union, as well as other developing countries, are constrained in what they can borrow from the rest of the world. In these countries, any available foreign exchange — given a current account constraint, the demand for exports and the servicing costs of external borrowing — is allocated to imports of goods from all other regions.

B The simulations modelled

THIS APPENDIX REPORTS the data underlying the scenarios modelled, including the schedule of tariff reductions used and the CEPT coverage shares.

Tariff reduction schedules

CEPT rates over period 1999–2005

The ASEAN Secretariat reports the path of CEPT reductions by the Harmonised Commodity Description and Coding System (HS) over the period 1996–2003 for all ASEAN members. Table B.3 shows the CEPT rates in years 1999 and 2002 for the ASEAN(5). The rates for year 2002 have been transposed from the rates reported for year 2003 rates, reflecting the decision at the sixth ASEAN Summit to advance implementation by one year from 2003 to 2002.

The CEPT rates in table B.3 were then aggregated, using production weights, to the APG-Cubed six-sector level. Production weights are favoured over import weights as import weights may give insufficient weighting to high, and therefore very distortionary, import tariffs. For example, if the high tariffs are successful in discouraging imports this will mean that they have a low weighting and the level of protection afforded by the tariff will be significantly underestimated. As protection encourages domestic production, local production is deemed to be the most suitable weight.

The schedule of CEPT reduction over the period 1999–2005 (and beyond) for ASEAN(5) members is reported in table B.4.

In determining the rate of tariff reduction there were two choices. Tariffs could either be reduced by a constant percentage or by a constant amount each year. The approach taken was to reduce tariffs by a constant amount between the period 1999–2002 and 2002–2005. This approach was adopted

B.3 **CEPT rates by HS classification system**

Commodity group/sector		*Indonesia*		*Malaysia*		*Philippines*		*Singapore*		*Thailand*	
HS Nos	***Description***	***1999***	***2002***	***1999***	***2002***	***1999***	***2002***	***1999***	***2002***	***1999***	***2002***
1–5	Live animals	10.9	4.4	2.4	1.04	7.05	3.81	0.00	0.00	16.49	4.62
6–14	Vegetable products	7.2	4.3	0.9	0.60	7.61	3.52	0.00	0.00	14.86	4.50
15	Fats and oils	5.2	4.6	1.4	1.38	5.44	3.19	0.00	0.00	7.65	4.16
16–24	Prepared foodstuffs	14.0	4.9	3.3	2.27	9.27	4.03	0.00	0.00	17.96	4.91
25–27	Mineral products	3.0	2.9	1.5	1.24	3.68	3.00	0.00	0.00	4.70	3.52
28–38	Chemicals	4.7	3.2	0.9	0.73	3.83	3.14	0.00	0.00	6.31	4.78
39–40	Plastics	6.6	4.2	5.0	3.76	7.29	3.91	0.00	0.00	12.17	4.91
41–43	Hides and leathers	4.7	2.8	2.6	2.31	9.24	3.59	0.00	0.00	6.63	4.19
44–46	Wood and wood articles	9.3	4.3	9.1	4.94	8.14	3.88	0.00	0.00	11.60	4.18
47–49	Pulp and paper	7.6	4.6	6.3	3.51	5.78	3.60	0.00	0.00	12.72	4.82
50–63	Textiles and apparel	8.7	4.9	4.5	4.04	9.59	4.33	0.00	0.00	7.65	4.96
64–67	Footwear	19.3	5.0	7.7	4.44	10.03	4.44	0.00	0.00	17.24	5.00
68–70	Cement and ceramics	8.7	4.5	2.8	1.70	8.02	4.19	0.00	0.00	9.64	4.95
71	Gems	7.0	3.8	3.0	2.98	6.05	3.46	0.00	0.00	4.42	3.12
72–83	Base metals	7.6	4.3	3.0	1.67	6.72	3.76	0.00	0.00	11.52	4.62
84–85	Machinery	6.3	3.9	3.7	2.27	4.94	3.45	0.00	0.00	7.20	4.10
86–89	Vehicles	4.4	2.1	6.5	2.63	4.39	3.32	0.00	0.00	11.33	4.10
90–92	Optical instruments	7.0	4.3	2.4	1.47	4.93	3.46	0.00	0.00	7.50	4.63
93	Arms	Na	Na	6.06	4.05	6.50	4.00	0.00	0.00	18.39	4.84
94–96	Miscellaneous	15.2	5.0	5.23	3.62	9.77	4.59	0.00	0.00	15.36	4.99
97–98	Antiques	15.0	4.6	3.00	1.67	11.43	5.00	0.00	0.00	8.33	2.50

Source: ASEAN Secretariat 1999b and CIE estimates.

as it reflects the approach outlined at the fifth ASEAN Summit.

> The reduction from existing tariff rates to 20% shall be completed within a time frame of 5 years… Member States are encouraged to adopt an annual rate of reduction, which shall be (X-20)%/5… (ASEAN Secretariat 1995)

Hence the approach adopted when determining the schedule of CEPT rate reduction was (using period 1999–2002 as an example):

$$Rate_t = Rate_{t-1} + \left(\frac{Rate2002 - Rate1999}{3} \right)$$

B.4 CEPT rates over 1999–2005 and beyond

ASEAN country	*Sector*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*
		Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
Indonesia	Agriculture	8.0	6.8	5.6	4.4	2.9	1.5	0.0
	Energy	1.8	1.8	1.8	1.7	1.2	0.6	0.0
	Mining	0.6	0.6	0.6	0.6	0.4	0.2	0.0
	Non-durables	11.3	9.1	6.8	4.6	3.1	1.5	0.0
	Durables	7.7	6.5	5.3	4.0	2.7	1.3	0.0
	Services[a]	2.0	2.0	2.0	2.0	1.3	0.7	0.0
Malaysia	Agriculture	1.4	1.2	1.1	0.9	0.6	0.3	0.0
	Energy	1.0	0.9	0.9	0.8	0.5	0.3	0.0
	Mining	0.1	0.1	0.1	0.1	0.1	0.0	0.0
	Non-durables	3.7	3.4	3.0	2.7	1.8	0.9	0.0
	Durables	4.5	3.8	3.2	2.5	1.7	0.8	0.0
	Services[a]	1.9	1.9	1.9	1.9	1.3	0.6	0.0
Philippines	Agriculture	7.3	6.0	4.8	3.6	2.4	1.2	0.0
	Energy	0.9	0.9	0.8	0.7	0.5	0.2	0.0
	Mining	1.4	1.3	1.2	1.1	0.7	0.4	0.0
	Non-durables	8.7	7.1	5.5	4.0	2.6	1.3	0.0
	Durables	5.6	4.9	4.2	3.6	2.4	1.2	0.0
	Services[a]	2.1	2.1	2.1	2.1	1.4	0.7	0.0
Singapore	Agriculture	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Energy	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Non-durables	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Durables	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Services[a]	2.2	2.2	2.2	2.2	1.5	0.7	0.0
Thailand	Agriculture	15.0	11.5	8.0	4.5	3.0	1.5	0.0
	Energy	1.5	1.4	1.3	1.1	0.8	0.4	0.0
	Mining	1.4	1.3	1.1	1.0	0.7	0.3	0.0
	Non-durables	13.3	10.5	7.7	4.9	3.2	1.6	0.0
	Durables	9.4	7.7	5.9	4.2	2.8	1.4	0.0
	Services[a]	2.2	2.2	2.2	2.2	1.5	0.7	0.0

a Percentage cost reduction (still) achievable following service trade liberalisation.

Source: CIE 1999, ASEAN Secretariat 1999b and CIE calculations.

AFTA-CER rates

Table B.5 shows the schedule of tariff reduction for Australia and New Zealand on formation of an AFTA-CER link. Under this scenario CER countries are assumed to abide by the AFTA CEPT reduction schedule (tariffs between 0–5 per cent by 2002 and abolished by 2005). As the majority of CER MFN tariffs are, as of 1999, already lower than 5 per cent we have progressively reduced the tariffs on ASEAN imports from the 1999 MFN rate (see table 3.3 in chapter 3) to zero by 2005.

B.5 CER rates under AFTA-CER link

CER country	*Sector*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*
		%	%	%	%	%	%	%
Australia	Agriculture	0.6	0.5	0.4	0.3	0.2	0.1	0.0
	Energy	0.5	0.4	0.3	0.3	0.2	0.1	0.0
	Mining	0.4	0.3	0.3	0.2	0.1	0.1	0.0
	Non-durables	8.5	7.1	5.7	4.3	2.8	1.4	0.0
	Durables	5.2	4.3	3.5	2.6	1.7	0.9	0.0
	Services[a]	1.6	1.3	1.1	0.8	0.5	0.3	0.0
New Zealand	Agriculture	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	Energy	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mining	0.4	0.3	0.3	0.2	0.1	0.1	0.0
	Non-durables	4.2	3.5	2.8	2.1	1.4	0.7	0.0
	Durables	2.9	2.4	1.9	1.5	1.0	0.5	0.0
	Services[a]	1.7	1.4	1.1	0.9	0.6	0.3	0.0

a Percentage cost reduction (still) achievable following service trade liberalisation.

Source: CIE 1999, page 9 (tables 2.5 and 2.6) and CIE calculations.

APEC liberalisation over 1999–2010 and 1999–2020

Tables B.6 and B.7 detail the schedule of tariff reductions undertaken by APEC economies assuming that the APEC Bogor Declaration is fulfilled. Under this scenario APEC developed economies reduce their MFN tariff rates to zero by 2010 with APEC developing economies having until 2020 to reduce their MFN rates to zero.

B.6 **APEC developed economies tariff reductions over 1999–2010 and beyond**

Country	*Sector*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
		%	%	%	%	%	%	%	%	%	%	%	%
Australia	Agriculture	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.0
	Energy	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.0	0.0
	Mining	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0
	Non-durables	8.5	7.7	7.0	6.2	5.4	4.6	3.9	3.1	2.3	1.5	0.8	0.0
	Durables	5.2	4.7	4.3	3.8	3.3	2.8	2.4	1.9	1.4	0.9	0.5	0.0
	Services[a]	1.6	1.4	1.3	1.2	1.0	0.9	0.7	0.6	0.4	0.3	0.1	0.0
Chinese Taipei	Agriculture	21.1	19.2	17.3	15.3	13.4	11.5	9.6	7.7	5.8	3.8	1.9	0.0
	Energy	6.8	6.2	5.6	4.9	4.3	3.7	3.1	2.5	1.9	1.2	0.6	0.0
	Mining	0.9	0.8	0.7	0.7	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.0
	Non-durables	7.2	6.5	5.9	5.2	4.6	3.9	3.3	2.6	2.0	1.3	0.7	0.0
	Durables	13.6	12.4	11.1	9.9	8.7	7.4	6.2	4.9	3.7	2.5	1.2	0.0
	Services[a]	1.7	1.6	1.4	1.3	1.1	0.9	0.8	0.6	0.5	0.3	0.2	0.0
Hong Kong	Agriculture	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Energy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Non-durables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Durables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Services[a]	2.5	2.3	2.0	1.8	1.6	1.4	1.1	0.9	0.7	0.5	0.2	0.0
Japan	Agriculture	90.5	82.3	74.0	65.8	57.6	49.4	41.1	32.9	24.7	16.5	8.2	0.0
	Energy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Non-durables	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.0	0.0
	Durables	6.4	5.8	5.2	4.7	4.1	3.5	2.9	2.3	1.7	1.2	0.6	0.0
	Services[a]	1.5	1.4	1.3	1.1	1.0	0.8	0.7	0.6	0.4	0.3	0.1	0.0
New Zealand	Agriculture	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	Energy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mining	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0
	Non-durables	4.2	3.8	3.4	3.1	2.7	2.3	1.9	1.5	1.1	0.8	0.4	0.0
	Durables	2.9	2.6	2.4	2.1	1.8	1.6	1.3	1.1	0.8	0.5	0.3	0.0
	Services[a]	1.7	1.6	1.4	1.3	1.1	0.9	0.8	0.6	0.5	0.3	0.2	0.0

Continued over page

B.6 **APEC developed economies tariff reductions over 1999–2010 and beyond** (continued)

Country	*Sector*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
		%	%	%	%	%	%	%	%	%	%	%	%
Singapore	Agriculture	6.5	5.9	5.3	4.7	4.1	3.5	3.0	2.4	1.8	1.2	0.6	0.0
	Energy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Non-durables	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	Durables	4.6	4.2	3.8	3.3	2.9	2.5	2.1	1.7	1.3	0.8	0.4	0.0
	Services[a]	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6	0.4	0.2	0.0
United States	Agriculture	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0
	Energy	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	Mining	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	Non-durables	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.0
	Durables	3.5	3.2	2.9	2.5	2.2	1.9	1.6	1.3	1.0	0.6	0.3	0.0
	Services[a]	1.4	1.3	1.2	1.0	0.9	0.8	0.7	0.5	0.4	0.3	0.1	0.0

a Percentage cost reduction (still) achievable following service trade liberalisation.

Source: CIE 1999, page 9 (tables 2.5 and 2.6) and CIE calculations.

B.7 **APEC developing economies tariff reductions over 1999–2020 and beyond**

Country	*Sector*	*1990*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*
		%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
China	Agriculture	14.6	13.9	13.2	12.5	11.8	11.1	10.4	9.7	9.0	8.3	7.6	7.0	6.3	5.6	4.9	4.2	3.5	2.8	2.1	1.4	0.7	0.0
	Energy	8.7	8.3	7.9	7.5	7.0	6.6	6.2	5.8	5.4	5.0	4.6	4.1	3.7	3.3	2.9	2.5	2.1	1.7	1.2	0.8	0.4	0.0
	Mining	3.2	3.0	2.9	2.7	2.6	2.4	2.3	2.1	2.0	1.8	1.7	1.5	1.4	1.2	1.1	0.9	0.8	0.6	0.5	0.3	0.2	0.0
	Non-durables	36.1	34.4	32.7	30.9	29.2	27.5	25.8	24.1	22.3	20.6	18.9	17.2	15.5	13.8	12.0	10.3	8.6	6.9	5.2	3.4	1.7	0.0
	Durables	32.7	31.1	29.6	28.0	26.5	24.9	23.4	21.8	20.2	18.7	17.1	15.6	14.0	12.5	10.9	9.3	7.8	6.2	4.7	3.1	1.6	0.0
	Services[a]	2.2	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.0
Indonesia	Agriculture	8.0	7.6	7.2	6.8	6.5	6.1	5.7	5.3	4.9	4.6	4.2	3.8	3.4	3.0	2.7	2.3	1.9	1.5	1.1	0.8	0.4	0.0
	Energy	3.3	3.1	3.0	2.8	2.7	2.5	2.4	2.2	2.0	1.9	1.7	1.6	1.4	1.3	1.1	0.9	0.8	0.6	0.5	0.3	0.2	0.0
	Mining	1.5	1.4	1.4	1.3	1.2	1.1	1.1	1.0	0.9	0.9	0.8	0.7	0.6	0.6	0.5	0.4	0.4	0.3	0.2	0.1	0.1	0.0
	Non-durables	9.4	9.0	8.5	8.1	7.6	7.2	6.7	6.3	5.8	5.4	4.9	4.5	4.0	3.6	3.1	2.7	2.2	1.8	1.3	0.9	0.4	0.0
	Durables	11.3	10.7	10.2	9.7	9.1	8.6	8.1	7.5	7.0	6.4	5.9	5.4	4.8	4.3	3.8	3.2	2.7	2.1	1.6	1.1	0.5	0.0
	Services[a]	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.0

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B.7 **APEC developing economies tariff reductions over 1999–2020 and beyond** (continued)

Country	*Sector*	*1990*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*
		%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Malaysia	Agriculture	5.6	5.3	5.1	4.8	4.5	4.3	4.0	3.7	3.5	3.2	2.9	2.7	2.4	2.1	1.9	1.6	1.3	1.1	0.8	0.5	0.3	0.0
	Energy	2.4	2.3	2.2	2.1	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.3	0.2	0.1	0.0
	Mining	1.3	1.2	1.2	1.1	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.0
	Non-durables	5.6	5.3	5.1	4.8	4.5	4.3	4.0	3.7	3.5	3.2	2.9	2.7	2.4	2.1	1.9	1.6	1.3	1.1	0.8	0.5	0.3	0.0
	Durables	12.9	12.3	11.7	11.1	10.4	9.8	9.2	8.6	8.0	7.4	6.8	6.1	5.5	4.9	4.3	3.7	3.1	2.5	1.8	1.2	0.6	0.0
	Services[a]	1.9	1.8	1.7	1.6	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.5	0.4	0.3	0.2	0.1	0.0
Philippines	Agriculture	22.4	21.3	20.3	19.2	18.1	17.1	16.0	14.9	13.9	12.8	11.7	10.7	9.6	8.5	7.5	6.4	5.3	4.3	3.2	2.1	1.1	0.0
	Energy	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.0	0.0
	Mining	1.9	1.8	1.7	1.6	1.5	1.4	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.5	0.4	0.3	0.2	0.1	0.0
	Non-durables	17.1	16.3	15.5	14.7	13.8	13.0	12.2	11.4	10.6	9.8	9.0	8.1	7.3	6.5	5.7	4.9	4.1	3.3	2.4	1.6	0.8	0.0
	Durables	22.0	21.0	19.9	18.9	17.8	16.8	15.7	14.7	13.6	12.6	11.5	10.5	9.4	8.4	7.3	6.3	5.2	4.2	3.1	2.1	1.0	0.0
	Services[a]	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.0
Republic of Korea	Agriculture	23.2	22.1	21.0	19.9	18.8	17.7	16.6	15.5	14.4	13.3	12.2	11.0	9.9	8.8	7.7	6.6	5.5	4.4	3.3	2.2	1.1	0.0
	Energy	1.1	1.0	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.0
	Mining	1.7	1.6	1.5	1.5	1.4	1.3	1.2	1.1	1.1	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.0
	Non-durables	7.5	7.1	6.8	6.4	6.1	5.7	5.4	5.0	4.6	4.3	3.9	3.6	3.2	2.9	2.5	2.1	1.8	1.4	1.1	0.7	0.4	0.0
	Durables	11.9	11.3	10.8	10.2	9.6	9.1	8.5	7.9	7.4	6.8	6.2	5.7	5.1	4.5	4.0	3.4	2.8	2.3	1.7	1.1	0.6	0.0
	Services[a]	1.7	1.6	1.5	1.4	1.4	1.3	1.2	1.1	1.0	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.0
Thailand	Agriculture	15.7	15.0	14.2	13.5	12.7	12.0	11.2	10.5	9.7	9.0	8.2	7.5	6.7	6.0	5.2	4.5	3.7	3.0	2.2	1.5	0.7	0.0
	Energy	1.5	1.4	1.4	1.3	1.2	1.2	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.5	0.4	0.4	0.3	0.2	0.1	0.1	0.0
	Mining	1.4	1.3	1.2	1.2	1.1	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.5	0.5	0.4	0.3	0.3	0.2	0.1	0.1	0.0
	Non-durables	21.6	20.6	19.5	18.5	17.5	16.5	15.4	14.4	13.4	12.3	11.3	10.3	9.3	8.2	7.2	6.2	5.1	4.1	3.1	2.1	1.0	0.0
	Durables	21.4	20.4	19.4	18.3	17.3	16.3	15.3	14.3	13.2	12.2	11.2	10.2	9.2	8.2	7.1	6.1	5.1	4.1	3.1	2.0	1.0	0.0
	Services[a]	2.2	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.0

a Percentage cost reduction (still) achievable following service trade liberalisation.

Source: CIE 1999, page 9 (tables 2.5 and 2.6) and CIE calculations.

CEPT coverage rates

Table B.8 shows the CEPT coverage for each ASEAN member by APG-Cubed sector classification. The data in table B.8 is then used to derive the time profile of CEPT coverage for ASEAN(5) members (see table B.9). We can estimate the CEPT coverage time profile as we know that those tariff lines on the Temporary Exclusion List need to be transferred to the Inclusion List by 2000, and lines currently on the Sensitive List are to be transferred to the Inclusion List over the period 2001–2003. (In the modelling, however, we have had to assume that items on the Sensitive List will move to the Inclusion List in 2010, at which point their CEPT rates are reduced to zero. This approach was adopted due to uncertainty surrounding the rate at which lines would be transferred to the Inclusion List, and the CEPT rate that those commodities would then attract.)

As noted in chapter 3, there are no CEPT rates for services and hence we are not able to derive service coverage shares. It has been assumed that all services will undergo trade liberalisation (that is, coverage of 100 per cent). This assumption is based on the decision taken at the sixth ASEAN Summit to expand service sector liberalisation beyond the original seven priority service sectors identified at fifth ASEAN Summit to cover all service sectors and modes of service supply. The original seven priority service sectors identified for liberalisation comprised financial services, maritime transport, telecommunications, air transport, tourism, construction and business services.

B.8 **Coverage by APG-cubed commodity classification**

ASEAN country/sector		*IL*		*TEL*		*SL*		*GEL*		*Total*
		Tariff lines	Share	Tariff lines	Share	Tariff lines	Share	Tariff lines	Share	Tariff lines
Indonesia	Agriculture	611	92.4	46	7.0	4	0.6	0	0.0	661
	Energy	55	91.7	5	8.3	0	0.0	0	0.0	60
	Mining	112	98.2	2	1.8	0	0.0	0	0.0	114
	Non-durables	3247	96.5	81	2.4	0	0.0	36	1.1	3364
	Durables	2867	97.2	46	1.6	0	0.0	36	1.2	2949
Malaysia	Agriculture	566	87	14	2.2	69	10.8	0	0.0	649
	Energy	68	100.0	0	0.0	0	0.0	0	0.0	68
	Mining	127	99.2	1	0.8	0	0.0	0	0.0	128
	Non-durables	3897	98.1	13	0.3	19	0.5	42	1.1	3971
	Durables	3961	92.9	282	6.6	0	0.0	21	0.5	4264

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B.8 **Coverage by APG-cubed commodity classification (continued)**

ASEAN	*Sector*	*IL*		*TEL*		*SL*		*GEL*		*Total*
		Tariff lines	Share	Tariff lines	Share	Tariff lines	Share	Tariff lines	Share	Tariff lines
Philippines	Agriculture	490	83.3	36	6.1	62	10.5	0	0.0	588
	Energy	43	89.6	5	10.4	0	0.0	0	0.0	48
	Mining	114	100.0	0	0.0	0	0.0	0	0.0	114
	Non-durables	2468	96.0	92	3.6	0	0.0	10	0.4	2570
	Durables	2296	96.5	66	2.8	0	0.0	18	0.8	2380
Singapore	Agriculture	564	100.0	0	0.0	0	0.0	0	0.0	564
	Energy	63	100.0	0	0.0	0	0.0	0	0.0	63
	Mining	108	100.0	0	0.0	0	0.0	0	0.0	108
	Non-durables	2695	98.6	0	0.0	0	0.0	38	1.4	2733
	Durables	2351	100.0	0	0.0	0	0.0	0	0.0	2351
Thailand	Agriculture	623	98.9	0	0.0	7	1.1	0	0.0	630
	Energy	53	100.0	0	0.0	0	0.0	0	0.0	53
	Mining	144	100.0	0	0.0	0	0.0	0	0.0	144
	Non-durables	4641	99.4	27	0.6	0	0.0	0	0.0	4668
	Durables	3530	99.7	10	0.3	0	0.0	0	0.0	3540
Brunei Daussalam	Agriculture	568	97.4	0	0.0	14	2.4	1	0.2	583
	Energy	114	100.0	0	0.0	0	0.0	0	0.0	114
	Mining	61	100.0	0	0.0	0	0.0	0	0.0	61
	Non-durables	3123	98.0	0	0.0	0	0.0	65	2.0	3188
	Durables	2360	94.6	0	0.0	0	0.0	136	5.4	2496
Cambodia	Agriculture	191	31.6	357	59.1	50	8.3	6	1.0	604
	Energy	83	71.6	33	28.4	0	0.0	0	0.0	116
	Mining	43	59.7	12	16.7	0	0.0	17	23.6	72
	Non-durables	1070	36.2	1808	61.1	0	0.0	80	2.7	2958
	Durables	1722	56.2	1313	42.8	0	0.0	31	1.0	3066
Lao PDR	Agriculture	154	46.0	92	27.5	85	25.4	4	1.2	335
	Energy	1	1.4	73	98.6	0	0.0	0	0.0	74
	Mining	0	0.0	34	100.0	0	0.0	0	0.0	34
	Non-durables	444	28.9	1055	68.6	3	0.2	35	2.3	1537
	Durables	648	41.2	872	55.5	0	0.0	51	3.2	1571
Myanmar	Agriculture	269	53.7	216	43.1	10	2.0	6	1.2	501
	Energy	4	3.8	101	96.2	0	0.0	0	0.0	105
	Mining	0	0.0	42	100.0	0	0.0	0	0.0	42
	Non-durables	759	30.1	1740	69.0	11	0.4	12	0.5	2522
	Durables	1300	57.1	888	39.0	0	0.0	90	4.0	2278
Vietnam	Agriculture	366	78.0	68	14.5	33	7.0	2	0.4	469
	Energy	103	87.3	5	4.2	0	0.0	10	8.5	118
	Mining	37	77.1	1	2.1	0	0.0	10	20.8	48
	Non-durables	1433	72.7	468	23.8	15	0.8	54	2.7	1970
	Durables	1634	73.6	465	21.0	0	0.0	120	5.4	2219

Source: ASEAN Secretariat CEPT Product Lists (2000) and CIE calculations.

B.9 **CEPT coverage rates to 2010 and beyond**

ASEAN country	*Sector*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
		Share (%)	Share (%)	Share (%)	Share (%)	Share (%)	Share (%)	Share (%)	Share (%)	Share (%)	Share (%)	Share (%)	Share (%)
Indonesia	Agriculture	92.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	100.0
	Energy	91.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Mining	98.2	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Non-durables	96.5	98.9	98.9	98.9	98.9	98.9	98.9	98.9	98.9	98.9	98.9	98.9
	Durables	97.2	98.8	98.8	98.8	98.8	98.8	98.8	98.8	98.8	98.8	98.8	98.8
Malaysia	Agriculture	87.2	89.4	89.4	89.4	89.4	89.4	89.4	89.4	89.4	89.4	89.4	100.0
	Energy	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Mining	99.2	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Non-durables	98.1	98.5	98.5	98.5	98.5	98.5	98.5	98.5	98.5	98.5	98.5	98.9
	Durables	92.9	99.5	99.5	99.5	99.5	99.5	99.5	99.5	99.5	99.5	99.5	99.5
Philippines	Agriculture	83.3	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	100.0
	Energy	89.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Mining	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Non-durables	96.0	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6
	Durables	96.5	99.2	99.2	99.2	99.2	99.2	99.2	99.2	99.2	99.2	99.2	99.2
Singapore	Agriculture	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Energy	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Mining	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Non-durables	98.6	98.6	98.6	98.6	98.6	98.6	98.6	98.6	98.6	98.6	98.6	98.6
	Durables	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Thailand	Agriculture	98.9	98.9	98.9	98.9	98.9	98.9	98.9	98.9	98.9	98.9	98.9	100.0
	Energy	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Mining	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Non-durables	99.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Durables	99.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: ASEAN Secretariat 2000b and CIE calculations.

C Detailed results from the APG-cubed model

DETAILED RESULTS UNDERLYING the charts and tables presented in chapter 3 are presented here.

C.10 **Effects of trade liberalisation on country GDP** Percentage deviation from baseline

	Australia	*New Zealand*	*Indonesia*	*Malaysia*	*Philippines*	*Singapore*	*Thailand*
	%	%	%	%	%	%	%
AFTA-CER only							
2000	-0.01	-0.03	0.03	-0.03	-0.01	-0.02	-0.03
2001	0.07	0.11	0.04	-0.03	0.04	-0.05	-0.01
2002	0.13	0.17	0.05	-0.04	0.06	-0.07	0.00
2003	0.19	0.22	0.11	0.00	0.13	-0.05	0.06
2004	0.24	0.27	0.17	0.04	0.21	-0.03	0.14
2005	0.29	0.31	0.24	0.09	0.30	0.01	0.22
2006	0.30	0.30	0.28	0.10	0.32	0.02	0.25
2007	0.28	0.28	0.31	0.11	0.32	0.04	0.26
2008	0.27	0.27	0.33	0.12	0.32	0.05	0.28
2009	0.25	0.27	0.35	0.13	0.32	0.07	0.29
2010	0.25	0.26	0.36	0.13	0.32	0.08	0.29
2011	0.24	0.26	0.37	0.14	0.32	0.09	0.30
2012	0.24	0.26	0.37	0.14	0.31	0.10	0.30
2013	0.24	0.26	0.38	0.14	0.31	0.12	0.30
2014	0.24	0.26	0.38	0.14	0.30	0.13	0.30
2015	0.24	0.26	0.37	0.15	0.29	0.14	0.29
2016	0.24	0.26	0.37	0.15	0.29	0.14	0.29
2017	0.24	0.26	0.36	0.15	0.28	0.15	0.29
2018	0.25	0.26	0.35	0.15	0.27	0.16	0.28
2019	0.25	0.27	0.35	0.15	0.27	0.16	0.28
2020	0.25	0.27	0.34	0.15	0.26	0.17	0.27
APEC only							
2000	-0.01	0.26	0.58	-0.07	-0.12	0.27	-0.27
2001	0.43	0.58	0.84	-0.15	0.27	0.18	0.02
2002	0.86	0.80	1.14	-0.02	0.59	0.06	0.29
2003	1.24	0.99	1.48	0.09	0.83	-0.05	0.52
2004	1.57	1.17	1.86	0.24	1.06	-0.13	0.78
2005	1.85	1.35	2.26	0.38	1.28	-0.19	1.03
2006	2.10	1.51	2.71	0.55	1.55	-0.19	1.34
2007	2.34	1.67	3.17	0.72	1.82	-0.17	1.66
2008	2.58	1.83	3.63	0.90	2.07	-0.11	1.96
2009	2.82	1.99	4.07	1.08	2.32	-0.01	2.26
2010	3.09	2.16	4.51	1.30	2.55	0.15	2.55
2011	3.11	2.16	4.90	1.38	2.75	0.26	2.81
2012	3.02	2.11	5.24	1.45	2.92	0.38	3.05
2013	2.92	2.07	5.54	1.53	3.07	0.49	3.26
2014	2.84	2.04	5.80	1.60	3.22	0.60	3.46
2015	2.80	2.03	6.03	1.67	3.35	0.69	3.64
2016	2.79	2.02	6.23	1.75	3.48	0.78	3.81
2017	2.79	2.02	6.41	1.82	3.60	0.85	3.98
2018	2.80	2.03	6.57	1.91	3.72	0.92	4.14
2019	2.82	2.03	6.71	2.02	3.85	0.98	4.30
2020	2.84	2.03	6.85	2.11	3.93	1.05	4.46

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C.10 **Effects of trade liberalisation on country GDP** Percentage deviation from baseline (continued)

	Australia	*New Zealand*	*Indonesia*	*Malaysia*	*Philippines*	*Singapore*	*Thailand*
	%	%	%	%	%	%	%
AFTA-CER and APEC							
2000	-0.01	0.29	0.62	-0.15	-0.11	-0.04	-0.28
2001	0.45	0.64	0.92	-0.20	0.32	-0.17	0.04
2002	0.90	0.86	1.25	-0.04	0.65	-0.27	0.32
2003	1.30	1.06	1.61	0.10	0.90	-0.36	0.57
2004	1.63	1.25	2.02	0.28	1.14	-0.42	0.84
2005	1.92	1.43	2.45	0.45	1.36	-0.45	1.11
2006	2.16	1.56	2.92	0.64	1.63	-0.42	1.43
2007	2.39	1.70	3.39	0.82	1.89	-0.37	1.74
2008	2.61	1.84	3.86	1.01	2.14	-0.29	2.06
2009	2.84	1.98	4.31	1.21	2.38	-0.17	2.36
2010	3.10	2.13	4.74	1.43	2.61	0.02	2.65
2011	3.11	2.14	5.13	1.52	2.80	0.15	2.91
2012	3.02	2.09	5.47	1.60	2.96	0.29	3.14
2013	2.92	2.05	5.76	1.68	3.11	0.43	3.35
2014	2.84	2.03	6.02	1.76	3.25	0.55	3.55
2015	2.80	2.02	6.23	1.84	3.38	0.66	3.73
2016	2.79	2.01	6.42	1.91	3.50	0.76	3.90
2017	2.79	2.01	6.59	1.99	3.62	0.85	4.06
2018	2.80	2.01	6.74	2.08	3.74	0.93	4.22
2019	2.82	2.02	6.87	2.19	3.86	1.00	4.38
2020	2.83	2.02	6.99	2.28	3.93	1.07	4.53

Source: APG-Cubed model.

C.11 **Effects of trade liberalisation on investment** Percentage deviation from baseline

	Australia	*New Zealand*	*Indonesia*	*Malaysia*	*Philippines*	*Singapore*	*Thailand*
	%	%	%	%	%	%	%
AFTA-CER only							
2000	0.25	0.74	0.36	0.65	0.45	0.79	0.42
2001	0.32	0.71	0.34	0.54	0.40	0.63	0.36
2002	0.38	0.64	0.31	0.46	0.31	0.51	0.29
2003	0.43	0.58	0.34	0.39	0.28	0.40	0.26
2004	0.48	0.54	0.37	0.34	0.27	0.30	0.26
2005	0.53	0.53	0.41	0.30	0.29	0.22	0.27
2006	0.52	0.54	0.38	0.26	0.27	0.16	0.25
2007	0.49	0.54	0.34	0.23	0.23	0.12	0.22
2008	0.46	0.54	0.31	0.20	0.20	0.08	0.20
2009	0.44	0.54	0.28	0.17	0.18	0.04	0.18
2010	0.42	0.53	0.26	0.15	0.17	0.01	0.16
2011	0.41	0.53	0.24	0.13	0.16	-0.02	0.14
2012	0.40	0.53	0.22	0.12	0.16	-0.04	0.13
2013	0.40	0.53	0.21	0.10	0.15	-0.07	0.12
2014	0.40	0.53	0.19	0.09	0.15	-0.09	0.11
2015	0.40	0.53	0.18	0.07	0.15	-0.10	0.10
2016	0.40	0.53	0.17	0.06	0.14	-0.12	0.10
2017	0.40	0.53	0.17	0.05	0.14	-0.13	0.09
2018	0.40	0.53	0.16	0.04	0.14	-0.14	0.09
2019	0.40	0.53	0.16	0.03	0.14	-0.15	0.08
2020	0.40	0.54	0.15	0.02	0.14	-0.16	0.08
APEC only							
2000	0.46	1.60	5.91	10.14	4.24	8.64	5.68
2001	0.97	1.51	5.85	8.94	4.11	7.48	5.33
2002	1.49	1.44	5.63	8.19	3.92	6.52	5.03
2003	1.92	1.43	5.48	7.65	3.72	5.84	4.81
2004	2.27	1.44	5.42	7.22	3.55	5.30	4.67
2005	2.57	1.47	5.39	6.87	3.42	4.81	4.58
2006	2.82	1.53	5.45	6.59	3.36	4.35	4.55
2007	3.07	1.61	5.50	6.33	3.34	3.89	4.55
2008	3.32	1.72	5.55	6.10	3.33	3.45	4.56
2009	3.61	1.87	5.60	5.90	3.34	3.04	4.58
2010	3.96	2.08	5.66	5.77	3.39	2.75	4.64
2011	3.92	2.13	5.64	5.70	3.45	2.37	4.66
2012	3.76	2.12	5.59	5.60	3.49	2.04	4.67
2013	3.59	2.11	5.53	5.49	3.53	1.73	4.65
2014	3.46	2.10	5.47	5.36	3.55	1.45	4.63
2015	3.38	2.08	5.42	5.22	3.58	1.19	4.61
2016	3.34	2.08	5.38	5.07	3.60	0.96	4.59
2017	3.33	2.08	5.35	4.92	3.64	0.75	4.58
2018	3.33	2.09	5.34	4.78	3.70	0.57	4.58
2019	3.36	2.12	5.35	4.68	3.82	0.44	4.64
2020	3.40	2.17	5.38	4.38	3.73	0.32	4.45

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C.11 **Effects of trade liberalisation on investment** Percentage deviation from baseline (continued)

	Australia	*New Zealand*	*Indonesia*	*Malaysia*	*Philippines*	*Singapore*	*Thailand*
	%	%	%	%	%	%	%
AFTA-CER and APEC							
2000	0.46	1.54	6.18	11.32	4.31	10.44	5.91
2001	1.00	1.42	6.12	9.95	4.20	8.80	5.54
2002	1.52	1.31	5.87	9.05	3.99	7.60	5.22
2003	1.96	1.27	5.70	8.39	3.77	6.72	4.99
2004	2.31	1.27	5.62	7.87	3.60	6.02	4.83
2005	2.62	1.33	5.59	7.45	3.45	5.42	4.72
2006	2.87	1.44	5.61	7.09	3.39	4.85	4.68
2007	3.09	1.55	5.63	6.78	3.35	4.32	4.67
2008	3.33	1.68	5.65	6.50	3.34	3.81	4.66
2009	3.60	1.84	5.68	6.25	3.35	3.35	4.68
2010	3.94	2.05	5.72	6.10	3.39	3.01	4.72
2011	3.89	2.10	5.68	5.99	3.45	2.59	4.74
2012	3.73	2.09	5.61	5.86	3.49	2.24	4.74
2013	3.56	2.08	5.54	5.72	3.52	1.90	4.72
2014	3.44	2.07	5.47	5.57	3.54	1.59	4.69
2015	3.36	2.06	5.41	5.42	3.57	1.31	4.67
2016	3.32	2.06	5.37	5.25	3.60	1.07	4.64
2017	3.31	2.07	5.33	5.08	3.63	0.85	4.62
2018	3.32	2.08	5.31	4.93	3.69	0.66	4.63
2019	3.35	2.12	5.32	4.82	3.81	0.52	4.69
2020	3.38	2.17	5.34	4.50	3.72	0.39	4.49

Source: APG-Cubed model.

C.12 **Effects of trade liberalisation on real consumption** Percentage deviation from baseline

	Australia	*New Zealand*	*Indonesia*	*Malaysia*	*Philippines*	*Singapore*	*Thailand*
	%	%	%	%	%	%	%
AFTA-CER only							
2000	0.12	0.22	0.29	0.51	0.39	0.48	0.56
2001	0.23	0.66	0.36	0.62	0.53	0.57	0.71
2002	0.34	0.84	0.43	0.74	0.62	0.76	0.81
2003	0.42	0.97	0.54	0.92	0.74	1.06	0.98
2004	0.49	1.05	0.65	1.05	0.85	1.27	1.11
2005	0.54	1.06	0.74	1.12	0.91	1.41	1.19
2006	0.53	0.96	0.76	1.07	0.88	1.35	1.14
2007	0.49	0.87	0.75	1.01	0.82	1.32	1.07
2008	0.45	0.81	0.74	0.94	0.76	1.26	0.99
2009	0.42	0.77	0.72	0.88	0.70	1.20	0.91
2010	0.39	0.73	0.69	0.81	0.65	1.12	0.84
2011	0.37	0.71	0.65	0.75	0.60	1.04	0.76
2012	0.36	0.69	0.61	0.69	0.55	0.95	0.69
2013	0.35	0.68	0.57	0.63	0.50	0.86	0.62
2014	0.34	0.67	0.53	0.58	0.46	0.77	0.55
2015	0.33	0.66	0.48	0.52	0.42	0.67	0.49
2016	0.32	0.65	0.44	0.47	0.38	0.58	0.43
2017	0.31	0.63	0.40	0.43	0.34	0.48	0.37
2018	0.31	0.62	0.35	0.38	0.31	0.38	0.32
2019	0.30	0.61	0.31	0.34	0.28	0.28	0.27
2020	0.29	0.60	0.28	0.30	0.25	0.17	0.23
APEC only							
2000	0.40	3.55	5.18	6.92	2.53	4.00	6.50
2001	1.03	4.02	6.00	8.49	3.63	6.64	8.11
2002	1.65	4.14	6.68	10.25	4.40	8.29	9.24
2003	2.18	4.18	7.25	11.51	4.95	9.67	10.06
2004	2.62	4.16	7.77	12.50	5.40	10.90	10.72
2005	3.00	4.09	8.24	13.26	5.79	12.00	11.29
2006	3.32	4.00	8.71	13.92	6.19	13.11	11.86
2007	3.62	3.88	9.13	14.42	6.55	14.04	12.35
2008	3.91	3.75	9.50	14.76	6.86	14.81	12.73
2009	4.18	3.58	9.80	14.95	7.12	15.33	13.01
2010	4.45	3.38	10.03	14.95	7.33	15.50	13.21
2011	4.34	3.24	10.28	14.66	7.51	14.90	13.41
2012	4.11	2.97	10.42	14.36	7.64	14.29	13.51
2013	3.87	2.80	10.48	14.06	7.74	13.57	13.54
2014	3.68	2.71	10.47	13.78	7.81	12.80	13.51
2015	3.55	2.67	10.41	13.50	7.87	11.98	13.44
2016	3.46	2.66	10.31	13.22	7.92	11.13	13.31
2017	3.40	2.66	10.17	12.92	7.95	10.24	13.13
2018	3.36	2.67	9.99	12.56	7.95	9.31	12.87
2019	3.33	2.66	9.76	12.10	7.90	8.33	12.52
2020	3.30	2.67	9.52	11.33	7.67	7.25	11.85

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C.12 **Effects of trade liberalisation on real consumption** Percentage deviation from baseline (continued)

	Australia	*New Zealand*	*Indonesia*	*Malaysia*	*Philippines*	*Singapore*	*Thailand*
	%	%	%	%	%	%	%
AFTA CER and APEC							
2000	0.41	4.14	5.43	8.53	2.72	7.19	6.86
2001	1.07	4.65	6.35	10.25	3.88	9.32	8.57
2002	1.70	4.74	7.10	12.05	4.66	11.04	9.72
2003	2.25	4.72	7.72	13.32	5.20	12.32	10.55
2004	2.70	4.59	8.27	14.26	5.64	13.44	11.21
2005	3.07	4.37	8.76	14.95	6.01	14.41	11.76
2006	3.38	4.07	9.22	15.51	6.39	15.34	12.31
2007	3.65	3.80	9.62	15.89	6.72	16.14	12.76
2008	3.92	3.55	9.96	16.12	7.00	16.76	13.11
2009	4.17	3.33	10.23	16.19	7.23	17.14	13.36
2010	4.43	3.11	10.42	16.07	7.42	17.16	13.52
2011	4.32	3.01	10.63	15.68	7.58	16.42	13.68
2012	4.09	2.76	10.74	15.27	7.69	15.66	13.74
2013	3.86	2.61	10.75	14.87	7.76	14.80	13.74
2014	3.67	2.54	10.70	14.49	7.82	13.89	13.68
2015	3.55	2.51	10.60	14.12	7.87	12.92	13.57
2016	3.46	2.51	10.46	13.75	7.90	11.92	13.42
2017	3.40	2.52	10.27	13.36	7.91	10.89	13.20
2018	3.36	2.53	10.06	12.93	7.90	9.81	12.92
2019	3.33	2.54	9.80	12.39	7.84	8.69	12.54
2020	3.31	2.57	9.52	11.56	7.60	7.46	11.85

Source: APG-Cubed model.

D Methodology to estimate the impact of AFTA-CER for the five later entrants to ASEAN

THE LAST FIVE MEMBERS to join ASEAN are smaller economies with the exception of Vietnam. Good data on bilateral trade flows, trade barriers and on the economic links between sectors within each economy that is necessary to calculate the benefits from an AFTA-CER trade link is not available. For this reason the later entrants to ASEAN of Brunei Darussalam, Cambodia, Lao PDR, Myanmar and Vietnam have not been included in the formal modelling exercise. Rather, a simple approximation of the benefits has been make using what characteristics we do know about each economy, its exports and imports and the barriers to trade.

The effect of AFTA-CER trade liberalisation on ASEAN(5) members is used to approximate the effects of such liberalisation on the newer ASEAN members. Two sources of GDP gain are identified — direct and indirect.

A relationship between CER trade shares and MFN tariff rates and liberalisation outcomes for ASEAN(5) members is established. This relationship is then used to approximate the direct gain to the newer ASEAN members from an AFTA-CER link using the respective members' CER trade shares and MFN rates to scale the GDP gains associated with export promotion and tariff reduction. The indirect gains are a function of the extent of trade with ASEAN(5) countries, ASEAN(5) economic activity and the importance of exports to GDP. The steps undertaken to calculate the direct and indirect gains are detailed below.

Table D.13 provides details of ASEAN(5) and newer ASEAN members' trade with other economies. Weighted average MFN tariff rates for ASEAN(5) members were taken from Fukase and Martin (1999). MFN rates are 7.8 per cent for Indonesia, 3.6 per cent for Malaysia, 10.9 per cent for the Philippines and 13.7 per cent for Thailand. Fukase and Martin (1999) report that Singapore's MFN rates are close to zero, although some specific tariffs are collected from commodities such as automobiles and petroleum oils. For this exercise we have assumed that Singapore's MFN rates are zero

(note that this was not the assumption in the formal modelling exercise — see table 3.3). MFN rates for the newer ASEAN members are detailed in table 5.1.

Calculating the direct GDP gain

Five steps are followed in establishing the relationship between trade liberalisation and GDP gains for ASEAN(5) members. It has been assumed that all of the GDP gain for ASEAN(5) countries (see table C.10) is a direct gain.

Step 1 — Determine the percentage fall in cost of imports from CER economies.

Step 2 — Use (1) and the share of imports from CER economies to calculate the percentage fall in cost of the total import bundle.

Step 3 — Use results for Singapore (no tariff reduction as MFN rates are assumed to be already zero) to derive relationship between GDP gain from trade liberalisation and share of exports to CER economies.

Step 4 — Use (3) and ASEAN(5) members' share of exports to CER to calculate export promotion gain from trade liberalisation by CER economies (note that this step requires the assumption that all ASEAN members' CER trade profile mirrors that of Singapore's).

Step 5 — GDP gain not explained by (4) is assumed to arise through MFN reduction on CER imports. The percentage change in cost of import bundle calculated in step (2) is used to derive the (average) relationship between import cost reduction and GDP gain.

Values established in steps (3) and (5) are then applied to the newer ASEAN members' MFN rate reductions (table 5.1) and share of exports to CER economies (table D.13) to derive direct GDP gain from extending AFTA to include CER economies.

D.13 **ASEAN members trade with other economies**[a]

ASEAN members	*Share of exports going to*			*Share of imports coming from*			*Total trade with AFTA-CER*
	ASEAN	*CER*	*Other*	*ASEAN*	*CER*	*Other*	
	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
ASEAN(5) members[b]							
Indonesia	13.7	3.2	83.1	10.5	6.4	83.1	16.9
Malaysia	6.6	2.0	91.4	21.3	2.9	75.8	16.5
Philippines	26.3	2.7	71.0	24.8	1.5	73.7	27.6
Singapore	19.1	1.8	79.2	12.1	2.4	85.5	17.5
Thailand	11.5	1.1	87.4	12.5	2.7	84.8	14.2
Newer ASEAN members[c]							
Brunei Darussalam	20.9	0.7	78.4	45.5	1.5	53.0	31.4
Cambodia	66.5	0.2	33.4	74.3	0.5	25.2	72.1
Lao PDR	64.9	0.0	35.1	55.9	0.4	43.7	59.5
Myanmar	38.4	0.5	61.1	51.5	0.3	48.2	47.4
Vietnam	24.3	5.0	70.7	27.1	1.3	71.6	28.8

a An absence of readily available, current and consistent data has necessitated deriving the estimates presented in this table from a variety of sources. As such, the estimated values should be treated with caution as they may not relate to the same year (latest available data was used) or may have been derived using disparate information sources that are not strictly comparable. **b** Only ASEAN(5) member's trade with other ASEAN(5) members is reported as this is what the APG-Cubed model works off. **c** Newer ASEAN members trade with all other ASEAN(10) members.

Source: IMF 1999 and 2000, Fukase and Martin 1999a, 1999b and 1999c, Robertson and Pohoresky 1997 and DFAT 1999b.

Calculating the indirect GDP gain

The indirect GDP gain for newer ASEAN members is calculated as:

$$Avg.\,ASEAN(5)\,GDP\,gain * \frac{Exports\,to\,ASEAN(5)}{Total\,Exports} * \frac{Exports\,to\,ASEAN(5)}{GDP}$$

The first two components of the above equation determine the (percentage) increase in exports from the newer ASEAN members. It is assumed that the effect of the ASEAN(5) GDP gain on newer ASEAN exports is directly proportionate to the share of exports going to the ASEAN(5) countries.

We would anticipate an increase in demand for exports from the newer ASEAN members as a result of the ASEAN(5) members experiencing GDP gains following AFTA-CER liberalisation. Such liberalisation makes the ASEAN(5) countries wealthier, resulting in an increase in demand for imports, some of which will be sourced from the newer ASEAN members. This in an indirect effect as the increase in demand for exports is the result of the effect of trade liberalisation on *other* countries, with some of the effect spilling over to impact on the newer ASEAN members.

The effect of an increase in exports on a country's GDP is determined by the relative importance of exports in that country's GDP (third term). The larger the portion of GDP accounted for by exports, then the larger the effect on GDP of an increase in exports.