Asia-Pacific
Economic Cooperation

APEC Economies Beyond the Asian Crisis:
Building the Future of APEC Economies
"Move Forward on the
New Economy and Entrepreneurship"

APEC Economic Committee (EC)

2000

FOREWORD

It was in early 1999,when the aftermath of the Asian crisis was the central concern of the APEC community, that the Economic Committee embarked on a major research project titled "APEC Economies beyond the Asian Crisis". The aim of this two-year project was to highlight the factors shaping the future of APEC economies, to outline likely scenarios for growth and trade in the APEC region, and to set out broad policy directions to achieve sustainable growth and equitable development.

At that time, there was a growing body of research, some controversial, on the causes of the crisis, and the prescriptions for resolving it and preventing similar crises in the future. This project drew on them, but did not intend to delve into the postmortem of the crisis. Instead, the project was forward-looking and growth-oriented, focusing on the long-term implications of the Asian crisis on the future of APEC economies over the next decade or two. The project also paid particular attention to the phenomenal advance of information technology and the emerging New Economy as major factors shaping future growth.

In September 1999, the Economic Committee submitted a *Progress Report* to the APEC Ministerial Meeting in Auckland. The report underscored that the Asian crisis had brought to light a number of structural weaknesses that needed to be addressed if APEC economies were to achieve robust economic growth over time. In December 1999, Japan, under the auspices of the Economic Committee, organized a symposium in Tokyo on "The Future of Asia-Pacific Economies" to discuss the project's interim research outputs and mobilize various views and perspectives. This was indeed a major undertaking for the Economic Committee. Some 40 participants from the APEC region and beyond shared analyses and views on key issues bearing on the future of APEC economies, with 250 people observing their discussions. Its *Papers and Proceedings* was published.

Building on the progress report and the outcome of the Tokyo symposium, the Economic Committee has completed its work with the publication of this *Final Report* and its presentation to the APEC Ministerial Meeting in November 2000 in Brunei Darussalam. The key messages of the report will likewise be conveyed to APEC Leaders.

Research work was carried out as a collaborative effort by four lead economies; Japan (growth potential, coordinator), Korea (trade prospects), Chinese Taipei (small- and medium-sized enterprises), and the Philippines (social impacts and policies). Many other economies contributed to the work by way of reviewing the analyses and earlier drafts.

The following are main writers of the *Final Report*. Messrs. Jun Saito and Minoru Masujima (Individual Report I), Dr. Inkyo Cheong and Mr. Chan-Buom Lee (Individual Report II), Drs. Ming Chung Chang, Ming-Weng Hu, and Jing-Long Liu (Individual Report III), and Drs. Dante B. Canlas and Celia M. Reyes (Individual Report IV). I drafted the Main Report, drawing on their work. I much appreciate great efforts of many other people who assisted these main writers in producing solid research results. Thanks are also due to Mr. Charles Jose, Director (Program) at the APEC Secretariat, who has taken responsibility for seeing this *Final Report* through to publication.

Mitsuru Taniuchi
Chair, APEC Economic Committee
Tokyo, November 2000

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Main Report

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Building the Future of APEC Economies
"Move Forward on the New Economy and Entrepreneurship"
MAIN REPORT

I. Introduction: *Learning from the crisis, seizing the new economy*

Two major challenges for future growth

The Asian crisis inflicted devastation on a number of APEC economies in Asia, rendering far-reaching impacts on practically all other APEC economies. In the wake of the crisis, many wondered what the future held for APEC economies in Asia and beyond, and were searching for a sense of direction on the long-term prospects. Three years after the onset of the crisis, many Asian economies are now coming on strong, putting the sharp economic contraction behind them. Can they return to the same old growth trajectory? Was the Asian crisis, after all, just a hiccup for strong economies albeit a heart-stopping one? One cannot be so cavalier. A "business-as-usual" extrapolation of the pre-crisis trend is unlikely to be a good guide for growth prospects in the next decade or two. The reason is that the Asian crisis has important long-term implications for the growth potentials and economic well-being of APEC economies in Asia and beyond.

In the meantime, the phenomenal advance of information technology has posed both challenges and opportunities for all APEC economies. As did the new general-purpose technologies in the past, such as the steam engine and electric power, information technology holds the promise of raising economy-wide productivity with pervasive impacts on all sectors. On the one hand information technology has the potential to usher in the "new economy", in which long-term growth is raised by productivity gains triggered by the advance of information technology.[1] On the other hand, a major concern has been raised about the "digital divide," or the widening inequality between the haves and have-nots in terms of access to new technologies.

The rapid advance of information technology has also highlighted the growing importance of knowledge in creating economic value in virtually all sectors. The creation and dissemination of knowledge has been much facilitated by the greater use of computers and the Internet. The ability to create and exploit knowledge has become the key to the success of any economy to grow and achieve improvement in the quality of life.

APEC economies confront two major challenges in achieving dynamic, robust economic growth in the coming years. The ambition of promoting economic growth and improving people's living standards remains the backbone of what APEC cooperation is all about. APEC is well placed to assist its member economies to meet these challenges.

The first major challenge is the one posed by the Asian crisis. The crisis-hit Asian economies are now rapidly recovering to such an extent that the Asian crisis appears to

[1] The term 'the new economy' has been widely used in recent years, but its definition is not necessarily clear. The new economy could mean different things for different people. In business journalism, it often narrowly refers to IT industries, and by contrast more traditional industries like manufacturing are dubbed the old economy. In this paper, the new economy is defined more broadly, with the focus on the pervasive effects of information technology on productivity and growth potentials. The on-going OECD growth project takes a similar interpretation of the new economy.

have become a thing of the past. However, many of the challenges posed by the crisis still remain to be met. The second major challenge is the one posed by the new economy. The new economy, driven by information technology, presents both opportunities undreamed of in the past and huge challenges in taking advantage of new technologies. The long-term prospects of APEC economies hinge very much on how they meet these two major challenges to their future growth.

The Economic Committee maps out APEC's future and policy challenges

The Economic Committee began a major research project titled "*APEC Economies beyond the Asian Crisis*" in early 1999. The "Beyond-the-Crisis project" aims to highlight the factors shaping the future of APEC member economies, and outline likely scenarios for growth and trade in the APEC region. The project sets out broad directions of policies to achieve sustainable growth and equitable development. The project is forward-looking, rather than focusing on postmortems on the crisis.

The issues addressed in the "Beyond-the-Crisis project" are indeed wide-ranging. The research work has been carried out as a collaborative effort led by four 'lead economies': Japan (growth potential, coordinator), Korea (trade and investment), Chinese Taipei (SMEs: small and medium-sized enterprises), and the Philippines (social policies). All other economies have contributed to the work by reviewing the analyses and earlier drafts.

In September 1999, the Economic Committee (EC) submitted the progress report of the project to the APEC Ministerial Meeting in Auckland. The progress report elucidated that the Asian crisis had shed light on a number of structural weaknesses, which had earlier been largely masked by the glaring record of growth, and that Asian APEC economies would not be able to achieve robust growth in the long-term without redressing such structural weaknesses. It was noted that many other APEC economies, particularly developing member economies, confronted similar structural weaknesses. A key message of the report was that tackling structural weaknesses highlighted by the crisis would open the way for achieving renewed growth in the APEC region in the 21st century.

In December 1999, Japan organized, under the auspices of the Economic Committee, a major symposium on "The Future of Asian Pacific Economies" in Tokyo, Japan, to discuss the project's interim research outputs and mobilize various views and perspectives. Very active discussions were conducted throughout the two-day symposium by some 40 participants from the APEC region and beyond, with an audience of about 250, mostly from the business community, observing the discussions. "Papers and Proceedings: the APEC Economic Committee Symposium on the Future of Asia Pacific Economies" reports the outcome of the Tokyo symposium.

Building on the progress report and the outcomes of the Tokyo symposium, the Economic Committee now submits the final report of the "Beyond-the-Crisis project" to the APEC Ministerial Meeting in November 2000 in Brunei Darussalam. Its key messages will be conveyed to the APEC Leaders' Meeting as well.

II. Remaining Challenges from the Asian Crisis

The crisis highlighted the need for structural reforms for future growth

The Asian crisis breaking out in the middle of 1997 rocked the APEC region. In fact, the Asian crisis had wide-ranging and far-reaching impacts on APEC economies in Asia and beyond. The 1999 progress report addressed the long-term implications of the Asian crisis. Key points of its analysis are summarized below.

Broadly speaking, there were two groups of problems contributing to the onset of the crisis. The problems in the first group are of domestic nature. They include such problems as weaknesses in the domestic financial sector, inflexible exchange rates, and weak cooperate governance. The second group of problems is associated with the fact that international financial markets are inherently unstable. International financial markets are often subject to a massive turnaround of capital flows arising from volatile market psychology and the herd behavior of investors.

There has been a controversy over the issue of which group of problems, domestic or external, had been most important in instigating the crisis. One view holds that the Asian crisis was basically home-grown, considering domestic structural problems more important in causing the crisis, and that international financial markets simply provided a discipline, although disciplining likely went too far. Another view holds that the Asian crisis was basically caused by the inherent instability of international financial markets, putting less weight on domestic problems, many of which had been there for many years and were not serious enough to justify the onset of such a devastating crisis.

Although it has been much debated how much domestic structural problems contributed to instigating the crisis, there is no denying that the crisis highlighted a number of structural weaknesses in Asian economies in a stark manner. The Asian crisis revealed that Asian economies had such problems as under-regulated financial sectors, lax corporate governance, some problems in exchange rate policy and short-term capital flow management, and under-developed and often-neglected social safety nets. It is important to note that many APEC economies in Asia and beyond confront similar structural problems, albeit to varied extents.

These structural weaknesses may or may not have been the proximate causes of the crisis. However, what is certain is that unless the structural weaknesses highlighted by the crisis are redressed, economic growth potentials in the long-run will be hampered. The Asian crisis brought devastation to the region, but it may be a blessing to the extent that it has revealed the structural weaknesses to be redressed.

Asian economies have been recovering rapidly, and their short-term prospects are encouraging. A key question now is whether Asian economies will be able to regain their dynamism and achieve higher growth over the next decade and beyond. When it comes to long-term economic prospects, the structural weaknesses highlighted by the Asian crisis come into play. It is clear that a failure to strengthen the financial sector and corporate governance would lower growth potentials over time. Underdeveloped and often-neglected social safety nets certainly did not cause the crisis, but it is now clear that sustainable, equitable growth over time will not be possible without addressing the revealed structural weaknesses in social policies.

In the wake of the Asian crisis, APEC economies in Asia and beyond have been undertaking structural reforms to address the problems revealed by the crisis. Unrelenting efforts sustained over time are required for such structural reforms to bear fruit. Keeping the momentum going on structural reforms, despite the recent recovery, remains a major challenge for APEC economies if they are to sustain robust growth in the years ahead.

Equitable growth requires strengthening social policies

The Asian crisis had considerable social impacts on a wide range of areas, including employment, education and human capital, health and nutrition, and gender dimension. However, most of the social impacts highlighted were in fact long standing problems that were simply aggravated by the crisis; namely, most of the affected economies had only limited safety nets. Provision of social security and pension systems, unemployment insurance, medical/health insurance, and educational loans in these economies was weak or non-existent when the crisis broke out. Among the most affected economies, only Korea had a formal unemployment insurance scheme, though its coverage was limited when the crisis began.

Informal safety nets, such as reliance on family, had worked well in some economies, but they have limitations – particularly when misfortunes affect the society as a whole. There is clearly a role for government in helping households cope with economy-wide shocks. While governments of affected economies tried to maintain or increase their budgets for education, health and social services during the crisis, their efforts were apparently insufficient to address the problems at the time. In the wake of the crisis, governments have moved to increase social budgets. Except for the Philippines and Malaysia, the share of government expenditures on social safety nets and welfare in the total budget was increased in 1999 to address the social issues that came to light during the crisis.

An important point here is that distributional effects of the crisis' adverse shocks varied between rich and poor, across different socio-economic groups, and between men, women and children. In Korea, the number of regular female employees dropped by nearly 20% compared with a 7.4% decrease for their male counterparts. In Thailand, the decline in real income was most severe for those with education below elementary levels, workers of small and medium-sized enterprises, and those dependent on the informal sector for employment. For the Philippines, the average consumption reduction relative to income decline during the crisis was 94% for the poor, whereas it was 78% for the non-poor, indicating that the ability of the poor to protect consumption was more limited. Therefore, there is a need to focus assistance on those who can cope least well with the adverse effects of an economic downturn, particularly the poor. Reducing human deprivation is essential in attaining sustained socio-economic development.

More fundamental measures to address the social issues include sound macroeconomic policy and robust financial systems; an effective allocation and utilization of resources through well-focused targeting mechanisms and effective projects; and market reforms that expand job and income opportunities. Policies such as decentralization, engagement with civil society organizations, removal of social and institutional barriers that result from distinction of gender, ethnicity and social status will also be useful. In addition, actions by developed economies and multilateral organizations will be crucial to spur economic growth and reduce income inequality.

III. Emerging Challenges of the New Economy

The new economy poses both challenges and opportunities

The phenomenal advances in information technology (IT) have not only created new business opportunities, but also significantly changed the way businesses do business, and the way people work and live. In particular, the explosive rise of Internet use since the mid-1990s has begun to alter the relationships of businesses with their suppliers and customers. The expanding computing power of computers has also led to many scientific breakthroughs and their commercialization. It is no exaggeration to dub the recent rapid development of information technology the "IT Revolution."

Innovation is an engine of growth. Many innovations lead to new products or new production methods within specific industries, but some innovations are brought about by the development of new general-purpose technologies which exert major impacts across a wide range of industries. In the past, the advent of such general-purpose technologies as the steam engine, electric power, and the internal combustion engine gave rise to substantial changes in practically all industries, leading to economy-wide productivity gains. Information technology is the most recent example of a new general-purpose technology, one which has significant potential to raise the productivity growth of an economy and thereby contribute to the betterment of people's economic well-being.

The new economy emerges when an economy is able to raise economic growth through productivity gains triggered by the rapid advance of information technology.[2] As such, the new economy presents significant opportunities for any economy in the world, developed and developing economies alike, to achieve higher growth and realize higher living standards without igniting inflation. The new opportunities for growth arise from new business opportunities and "smarter" production made possible by both direct and spillover effects of information technology.

At the same time, the new economy poses big challenges. First, reaping full benefits of the new economy dictates institutional and organizational changes of major proportions, calling for the need to develop the right structural policy settings. The new economy is very much driven by the private/business sector. Yet, governments have an important role to play in providing the framework and conditions conducive to harnessing the new economy. Structural policy measures required to put the right conditions in place are indeed wide-ranging. They include competition and deregulation policies, trade and investment liberalization, education and basic research, infrastructure, corporate laws, intellectual property rights, taxation, and consumer protection.

The second, but no less important, challenge posed by the new economy is to prevent the "digital divide," ensuring that the benefits of the new economy are spread to all segments of society. There has been considerable concern that, as the new economy progresses,

[2] In the US, there was a significant step-up in overall labor productivity in the late 1990s. How much information technology contributed to this step-up in productivity is an important, intriguing issue for empirical studies. A number of studies including Oliner-Sichel (2000) and Jorgenson-Stiro (2000) point to a significant contribution of information technology. Notably, a recent speech by Fed Chairman Alan Greenspan (June 2000) carried much weight in supporting the nexus between information technology and overall productivity gains in the recent US economy. On the other hand, Robert Gordon (2000) is the most vocal skeptic doubting the significance of information technology in the recent rise in productivity.

inequality in income and wealth widens within one economy or across economies in different developmental stages. As information technology rapidly advances, access to new technology or lack thereof might lead to a new kind of 'haves' and 'have-nots' in the information age.

In preventing the digital divide, of key importance is education, since the quality of human resources is a major factor behind the invention and assimilation of new technologies. The new economy thus calls for quality education and life-long learning for both developed and developing economies. Computer literacy has become a new key element for education. Furthermore, for developing economies, there is much scope for developing infrastructure for information technology and capacity building for establishing the right framework and conditions, lest they be left behind in exploiting new opportunities.

(Box 1) ***The New Economy and the Knowledge-based Economy Go Hand in Hand***

Another closely inter-related new development in the world economy is the emerging trend towards the knowledge-based economy. The knowledge-based economy arises when knowledge has become increasingly important as an ingredient for production of almost all goods and services. Not long ago, land was perhaps the most important factor of production in the agricultural society, but land is no longer seen? as a major factor of production in today's economy. In a similar vein, capital and labor in the traditional sense (brick and mortar buildings, crude machines, and muscle labor) have become less important as factors of production, and knowledge has taken on growing importance in creating economic values.

The knowledge-based economy is not confined to IT-related industries. Knowledge about wide-ranging areas has become increasingly critical for more traditional industries. The ability to create and exploit knowledge has become the key to the success of any economy to grow and achieve improvement in the quality of life.

The knowledge-based economy and the new economy have different, but closely interrelated, focuses. The new economy focuses attention on information technology as a new driving force of economic growth, while the knowledge-based economy focuses on the growing importance of knowledge in all economic activities. Apart from this difference, the new economy and the knowledge-based economy have much on common in pointing to the fundamental changes in today's economy. Their resonating underlying idea is that something profound is afoot in the way an economy creates economic values and fosters productivity. Furthermore, the rapid advance of information technology has made the emerging trend towards the knowledge-based economy more prominent. The creation and dissemination of knowledge has been much facilitated by the greater use of computers and the Internet.

The advance of information technology and the growing importance of knowledge, which go hand in hand, have provided new opportunities for the betterment of economic life, while raising major challenges for the existing economic system.

IV. The Renewed Importance of Entrepreneurship

The new economy calls for entrepreneurship

As the era of the new economy unfolds, entrepreneurship has taken on renewed importance. Entrepreneurship is the ability to marshal resources in order to seize new business opportunities which have uncertain outcomes. As such, entrepreneurship is central to economic growth, particularly in times of strong technological change. The rapid advance of information technology and the growing importance of knowledge call for innovative ideas, individual initiative rather than organizational discipline,

adjustability, and greater speed in taking decisions. Thus, in the new economy, discovering new business opportunities, starting new businesses, and reinventing existing firms have taken on greater importance.

In times of rapid technological progress, there is much scope for entrepreneurial individuals and small firms to steal a march on larger firms that tend to take time to make decisions and often stifle innovative ideas in their hierarchical decision-making structure. For their part, many larger firms have reorganized their corporate structures into more decentralized ones, and adopted performance-based compensation for workers as well as executives, to encourage entrepreneurial initiatives and activities within their own organizations.

Entrepreneurship boosts economic growth and employment. To the extent that entrepreneurship is instrumental to harnessing new technologies, it promotes productivity gains and economic growth. Furthermore, evidence indicates that entrepreneurship contributes to job creation. Over the past decade or so, smaller firms (including newly-created firms) have been creating jobs, whereas larger firms have been reducing jobs in the major economies in the world. Fostering entrepreneurship has become an effective way to promote economic growth and employment. Priority consideration should be given to public policies that encourage entrepreneurship.

Needless to say, the key drivers of entrepreneurial activities are private businesses, and private initiatives are central to entrepreneurship. Yet, governments also have an important role to play in fostering entrepreneurship. The key role of government is to provide the right institutional and policy environment which enables entrepreneurship to flourish.

First and foremost, governments need to provide an environment in which the market mechanism functions most efficiently. Entrepreneurship cannot thrive when markets are not competitive. To that end, of particular importance are stable macroeconomic conditions, deregulation, and trade/investment liberalization. An important point to note here is that government regulations often place onerous disadvantages on entrepreneurs rather than existing companies.

Second, governments need to review whether corporate laws, taxation, and other institutional arrangements do not unduly penalize risk-taking, because entrepreneurs take risks to seek new or unexploited profit opportunities. For example, stringent regulations on the use of stock options need to be removed, and bankruptcy laws need to strike the right balance between the protection of interests of lenders and investors and the ability of bankrupt owners to try again.

Third, governments have a role in education and technology development, which have "externality," yielding greater benefits to society than the benefits accrued to individuals. The quality of human resources and access to technology are vital in fostering innovation, the backbone of entrepreneurship.

Fourth, many governments assist potential entrepreneurs and new companies by providing various business incubation services at no charge or a subsidized cost, and by enhancing the availability of finance through public financial institutions. The underlying idea is that governments need to complement markets in encouraging entrepreneurship with the aim of promoting growth and employment. There may be some grounds for such public

intervention, although the costs and benefits of measures need to be very carefully weighed.

SMEs are the hotbeds of entrepreneurship

In many APEC economies, SMEs (small and medium-sized enterprises) provide jobs for the majority of workers, producing substantial portions of GDP. Developing SMEs is a priority policy objective for promoting employment and growth, particularly for APEC developing economies. A well-developed and dynamic SME sector is not only an engine for growth, but also a hotbed for new businesses.

Among APEC economies, Chinese Taipei has a large, dynamic SME sector, which indeed has been a distinctive feature of its economy. The vital role of SMEs and the growing importance of entrepreneurship mean Chinese Taipei's SMEs merit a closer look. .

SMEs in Chinese Taipei now employ about 70% of total workers, and account for about half of the economy's GDP. Over the last few decades, they have dynamically developed. During that period, Chinese Taipei's economy has undergone significant changes, not least in the rapid pace of trade and investment liberalization since the mid-1980s. There was a widespread fear that the rapid, extensive liberalization would damage SMEs. Many small firms were indeed forced out of markets due to increased competition, but an even greater number of small firms entered markets. The net result is that SMEs have grown in importance, continuing the rising trend of their share in total production from 32% in the mid-1970s to 45% in 1996. They have managed to respond to changing conditions, transforming themselves from a predominantly labor-intensive sector to an increasingly technology-intensive sector. Furthermore, the well-developed, dynamic SME sector in Chinese Taipei helped cushion the adverse impacts of the Asian crisis. Even during 1998, the bottom year of the Asian crisis, in Chinese Taipei's economy more new small firms were created than firms going out of business.

In understanding the distinct dynamism of Chinese Taipei's SME sector, it is worth paying particular attention to its "vertically-disintegrated" structure. An industry is vertically disintegrated when different firms specializing in different stages of production are linked through a network of subcontractors, yet maintain high degree of independence. This distinguishing feature of Chinese Taipei's SMEs can be seen in both traditional sectors like footwear and high-tech sectors like semiconductors. Statistical evidence indeed confirms that Chinese Taipei's smaller firms are more closely inter-linked through intermediate inputs supply with other smaller firms than with larger firms.

This vertically-disintegrated structure makes Chinese Taipei's SME sector more competitive with active new market entries, because it reduces the size of a firm which can produce products most efficiently ("minimum efficient size") and thus encourages new firms to enter markets. A detailed comparative study on the footwear industry in Chinese Taipei and Korea indicates that market entry is in fact easier in Chinese Taipei. Vertical disintegration also enhances the agility of Chinese Taipei's SMEs in adapting to changing conditions through dynamic changes of subcontractor networks. It is worth noting that high-tech industries in Silicon Valley are also vertically disintegrated with a web of company networks.

As mentioned earlier, Chinese Taipei's SMEs have increasingly become technology-

oriented, and this transformation is gaining momentum. The emerging venture capital industry in Chinese Taipei has been playing an important role in this transformation. While the first venture capital firm was established in mid-1980s, there was a boom in venture capitalists in the late 1990s. The total number of firms expanded from 28 in 1994 to 153 in 1999, with investment funds totaling NT$94.7billion (US$3billion). Those venture capitalists, and venture capitalists in other economies, particularly in the US, have provided start-ups with much-needed equity funds often with business advice and expertise.

(Box 2) ***Fostering Entrepreneurship Merits Public Policies***

There is much scope for future research work to develop public policies for entrepreneurship, taking a closer look at the differing conditions APEC economies confront. The research of this project also provides a useful analytical basis to consider a menu of policies. The following areas are worth further study.

Establish enabling economic conditions
- ✧ Stable macroeconomic environment, deregulation, and trade/investment liberalization are of particular importance.

Expand access to finance
- ✧ Introduce "angel taxation" that does not levy high taxes on fluctuating investment incomes of individual investors in new businesses.
- ✧ Allow loss carryover for new businesses in corporate income taxes.
- ✧ Develop stock markets for new businesses that have lower listing requirements but require stringent rules on disclosure and de-listing.
- ✧ Review restrictions on equity investment by financial institutions without compromising prudence in their portfolios.
- ✧ Utilize public financial institutions to supplement finance from private sources.

Mobilize human resources for new businesses
- ✧ Increase labor market flexibility by deregulation.
- ✧ Revise as necessary the pension system and taxation with the view to restoring neutrality between continuing and changing jobs. For example, lack of portability of company pensions may discourage people from starting their own businesses.
- ✧ Promote internship for students, and life-long learning for workers of all age groups. Amend as necessary government regulations on educational/academic institutions.

Expand access to technologies and information
- ✧ Facilitate cooperation between universities and companies. "Technology transfer organizations" in the US may serve as a model. Deregulate as necessary regulations on commercial? activities of universities and researchers.
- ✧ Support basic research that has spillover effects to applied research and innovations.
- ✧ Strengthen intellectual property rights in developing economies.
- ✧ Push further for investment liberalization in developing economies. FDI brings in new technologies as well as financial resources.
- ✧ Examine the role of government in promoting business incubation.

Develop legal infrastructure
- ✧ Revise as necessary bankruptcy laws with the view to promoting new businesses and swift reconstruction of failed companies.
- ✧ Revise as necessary corporate laws and taxation regarding stock options. Stock options are a useful means for new businesses to pay remuneration to investors, executives, and workers.
- ✧ Revise as necessary corporate laws and taxation pertaining to corporate restructuring.

V. APEC Cooperation Building the Future of APEC Economies

Muster efforts to meet the challenges for future growth

The ambition of promoting higher living standards for all the people in the APEC region remains the backbone of APEC cooperation. To that end, achieving dynamic, robust

growth over time is of critical importance. This report has identified two major challenges for building the future of APEC economies; the remaining challenges posed by the Asian crisis and the emerging challenges posed by the new economy.

Much scope exists for APEC to assist its member economies to meet these challenges for future growth. APEC now undertakes a wide variety of cooperation activities, all of which merit the efforts of member economies. Yet, APEC needs to make extra efforts to focus on priority areas of cooperation among competing priorities, lest cooperation activities proliferate and resources of member economies are too thinly spread out.

This report suggests, as policy direction for APEC cooperation, that APEC muster efforts to meet the challenges for future growth, with the aim of achieving the ultimate goal of improving people's economic well-being. The challenges for future growth dictate many of the structural policy efforts on the part of member economies. APEC cooperation aimed at capacity building can be very instrumental in facilitating structural efforts of member economies.

APEC's way of cooperation, based on a voluntary, non-binding basis and some budgetary resources to fund cooperative activities, provide APEC with a unique comparative advantage over other international fora in addressing the challenges for future growth requiring often difficult structural measures. APEC economies can come forward and aim at higher standards by sharing best practices, and considering menus of options and harmonization of standards and procedures. APEC economies should make the best use of this unique advantage in pursuing effective cooperation.

Priority areas for cooperation: Building capacity for growth

Meeting the challenges of future growth posed by the Asian crisis and the new economy requires APEC to strengthen cooperation in certain areas. The previous analyses of this report point to the following five priority areas of cooperation that APEC needs to focus on.

- Strengthening markets
- E-commerce and technology cooperation
- Entrepreneurship and SME development
- Education and life-long learning
- Social safety nets

APEC has already undertaken various cooperation activities in the above areas. What is needed now is to place particular emphasis on carrying forward cooperation in the above five priority areas. To that end, member economies are encouraged to put forth new initiatives building on the on-going activities, and APEC fora undertaking closely-related activities need to touch base with each other so as to maximize synergy and avoid duplication of work. The Senior Officials' Meeting (SOM) Sub-committee on ECOTECH is well placed to coordinate relevant cooperation activities across different fora.

As the new economy is primarily driven by the private/business sector, and new technologies dictate far-reaching changes in business environments, APEC needs to deepen its relationship with the private/business sector. In carrying forward cooperation in the above priority areas, it is vital to ensure input of private/business sector perspectives at all levels from Leaders and various Ministers through to the working level. In particular,

the linkage with the APEC Business Advisory Council (ABAC) needs to be further strengthened.

One suggested option for Ministers in November this year is that Ministers agree on the need to muster efforts of APEC cooperation to meet the challenges for future growth, and direct relevant APEC fora to focus on cooperation activities in the five priority areas. The SOM will need to take charge of the follow-up task to ensure the implementation of Ministers' guidance.

1) Strengthening Markets

Well-functioning markets are the *sine qua non* for any economy to achieve robust growth. APEC's cooperation initiatives on strengthening markets have a direct bearing on developing the framework conditions conducive to meeting the challenges for future growth. Of particular importance are cooperation on competition policy and deregulation, financial sector strengthening, legal infrastructure development, and improving investment climates.

The work program of the "Road Map Initiatives" agreed by Ministers in 1999 has been implemented, and its progress report will be submitted to Ministers in November this year. The Competition Policy and Deregulation Workshop of CTI and SOM Sub-Committee on ECOTECH have played key roles here. Further efforts need to be expended beyond this year. In particular, there is much scope for the emerging cooperation in developing legal infrastructure for the private/business sector, by sharing best practices and examining the menu of options. The challenges posed by the Asian crisis and the new economy underline the significance of a legal infrastructure for the private/business sector.

2) E-commerce and Technology Cooperation

Future growth hinges on taking full advantage of new technologies. In particular, e-commerce has huge potential for bringing about the concrete benefits of new technologies, and poses commensurate challenges to overcome. As underscored by the APEC E-commerce Convention held in Tokyo this year, fostering the uptake of e-commerce in the APEC region requires capacity building and a legal/regulatory framework regarding e-commerce, and promotion of e-government. The Electronic Commerce Steering Group is a focal point for this task. Under the "E-commerce Readiness Assessment Initiative," several economies have conducted self-assessment on e-commerce readiness. More economies are encouraged to participate in this important self-assessment exercise. Cooperation on paperless trading should also be further promoted under the "Paperless Trading Initiative."

Strengthening technology cooperation in the telecommunications and information industry is called for to harness new technologies. In their meeting this year, Ministers in charge of telecommunications and information industry focused on the convergence of telecommunications, broadcasting, and information technology. Concrete cooperation activities need to be developed and carried forward on this score.

3) Entrepreneurship and SME Development

Work is underway in implementing the five-year "Action Plan for SMEs" endorsed by SME Ministers last year. This year, SME Ministers instructed the Policy Level Group on Small and Medium Enterprises to deepen its cooperation with other relevant APEC fora to strengthen the development of SMEs in priority areas.

Of particular importance is enhancing SMEs' access to finance. With the endorsement of SME Ministers, who encourage further work to promote the development of capital markets, Chinese Taipei has been organizing a series of seminars focusing on venture capitals and start-ups. The "Evolving Cooperation Initiatives for SMEs" has placed particular emphasis on capacity building for legal infrastructure relevant for SME development. Further such efforts are encouraged to produce concrete results.

4) Education and Life-long Learning

The quality of human resources is key to an economy's ability to harness new technologies and acquire knowledge, staving off the digital divide. For APEC developing economies, upgrading educational standards has acquired new urgency in the new economy. The growing importance of life-long learning applies to developing and developed economies alike. Labor market flexibility enables an economy to adjust to changing environments and reap the full benefits of new technologies, and workers need to enhance their "life-time employability" (rather than "life-time employment in the same company") through life-long learning.

In their meeting this year, Education Ministers underscored the importance of transforming education systems to the ones serving the foundation and impetus for the "Learning Society in the 21st Century," and the importance of information technology as a core competency for young people. Human Resource Development (HRD) Ministers, who will meet next year, will focus HRD in enhancing access to knowledge, skills, and technologies to build up a knowledge-based society. There exists much scope for sharing experiences of innovative educational programs and undertaking specific training for APEC officials in charge of education and HRD.

5) Social Safety Nets

The Asian crisis has starkly revealed the need for government-sanctioned schemes to assist the poor in times of sharp economic downturns. Meanwhile, economic and social changes arising from rapidly-progressing new technologies may lead to increased risks of financial hazard for people due to business failures and job losses.

In the midst of unfolding crisis situations, there is a limit to the ability of stopgap measures to mitigate devastating effects of the crisis on the unfortunate. Public assistance programs need to be planned and developed from long-term perspectives. For example, the lack of unemployment insurance in the crisis-hit economies failed to alleviate economic hardship of both workers losing jobs and their families. Yet, to introduce a new unemployment insurance program in the middle of acute phases of the crisis would be ill-timed, because the collection of insurance premiums would further dampen the economy.

The passage of the Asian crisis does not lessen the need for social safety nets. Furthermore, changing economic conditions arising from the new economy call for social policies in place. Now is the time for APEC to assist its developing economy members to develop and strengthen their social safety nets.

The Economic Committee's research underpins future growth

The basic role of the Economic Committee (EC) is to provide analytical underpinning for promoting APEC cooperation. The EC stands ready to further contribute to APEC's

efforts to build the future of APEC economies by undertaking forward-looking research work.

This year, the EC has prepared and submitted the reports of two major research projects pertaining to the challenges for future growth; the "Beyond-the-Crisis project," and the "KBE (knowledge-based economies) project." While the EC's work program for next year and beyond is yet to be developed, the two projects present rich breeding grounds for future work.

The report of the KBE project points to the need for a follow-up study to further develop specific cooperation mechanisms for the promotion of KBEs in the APEC region. One of the research themes ramifying from the report of the "Beyond-the-Crisis project" is entrepreneurship. Much scope exists for an in-depth study on differing conditions of entrepreneurship in APEC economies and possible cooperation mechanisms for fostering entrepreneurship, and it would be useful to carry forward such a study in close cooperation with APEC's SME group.

The preparation for the *2001 Economic Outlook*, the EC's key annual output, is already under way. The 2001 Outlook will look into the intriguing relationship between long-term economic growth and financial sector development in the APEC region. The Asian crisis highlighted the importance of sound development of the financial sector in warding off financial crises and ensuring economic stability. Another distinct issue concerning the financial sector relates to the linkage between financial development and economic growth in the long-run. The 2001 Outlook will provide useful perspectives to future growth by identifying the finance-growth nexus.

VI. Prospects of APEC Economies for the Next Decade

What future lies ahead for APEC economies?

The Asian crisis violently shook the widely-shared confidence in long-run growth prospects of Asian economies. But now Asian economies are coming on strong again. Meanwhile, Japan's economy, the largest in Asia, has finally started recovering, although at a modest pace. The US economy continues its strong growth, which has had salutary effects on many APEC economies. All in all, the short-term prospects of APEC economies are encouraging.

What future lies ahead for APEC economies over the next decade or so? Simple extrapolation of the short-term prospects would not be a useful guide for envisioning the future course of APEC economies in the long-run. For one thing, as discussed earlier, the Asian crisis has had long-term implications for APEC economies in Asia and beyond. For another, the emerging challenges posed by the new economy confront all APEC economies. Furthermore, the dynamism of the catch-up process in APEC developing economies will inevitably change as those economies shift to higher developmental stages, and demographic changes will also affect long-term growth prospects in all APEC economies, developing and developed alike.

The growing interdependence through trades has dynamically supported the region's growth, which in turn has helped deepen the trade linkage. Trade patterns will likely undergo dynamic changes as future growth evolves dynamically.

This section attempts to outline projections for growth and trade over the next decade, based on econometric work. Such projections will be useful in providing a sense of direction for APEC economies, which had been all but lost during the Asian crisis. They will also underscore the importance of taking on the challenges for future growth, providing a useful basis for future policy discussions.

Future growth in the APEC region

The overall long-run growth performance of APEC largely hinges on how APEC developing economies will evolve, since APEC developed economies, large as their share is in the region, are matured and their long-run growth prospects in the next decade will be unlikely to diverge substantially from the past records. Yet, future growth of APEC developed economies cannot escape from the challenges of new technologies and effects of demographic changes.

It is useful to lay out the major factors shaping future growth in the APEC region. First, as the above analyses highlighted, APEC economies confront important challenges for future growth; the remaining challenges posed by the Asian crisis and the emerging challenges of the new economy. Those challenges dictate structural policy efforts on the part of APEC economies. Success or failure of such efforts would affect future growth in large part through the pace of productivity gains and capital formulation.

Second, the dynamic evolution of the catch-up process is a critical factor affecting the future growth of APEC developing economies. The convergence theory of growth indicates that developing economies have potential to grow faster than developed economies, but the faster pace of growth eventually tapers off as they succeed in closing gaps in income and technology levels. The realization of such growth convergence is conditional on some key characteristics of developing economies, not least educational standards.

Third, demographic changes will exert major impacts on future growth in the APEC region. In particular, in many APEC developing economies, labor force growth is likely to decline rather significantly, since the fertility rate will decline as income levels and educational standards for women rise. APEC developed economies will also undergo demographic changes. Notably, the rapid pace of aging in Japan in the next few decades will be unprecedented anywhere in the world.

The projection results are summarized in Table 1. The underlying scenario is that APEC economies will strive to meet the challenges for future growth, undertaking the necessary structural policies.

APEC economies as a whole will grow at 2.7% a year over the next decade through the year 2010. This projected pace of growth is comparable to the region's growth performance during the 1990s prior to the Asian crisis. Over the next decade, APEC developed economies will achieve a stable growth of 2.1% a year, and APEC developing economies will expand at 5.4% a year. Accordingly, APEC developing economies will be closing in on APEC developed economies, growing more than twice as rapidly as the latter. Generally, among APEC developing economies, less developed economies will grow even faster.

It is noteworthy that the projected growth of 5.4% of APEC developing economies is somewhat lower than the growth in the 1990s prior to the crisis (6.4% in 1990-1996). What factors will be at work in moderating growth over time? First, these economies, particularly higher-income developing economies, will likely moderate growth as they shift further to higher developmental stages and the process of convergence gets underway. Second, the pace of capital formulation was in all likelihood overheated during the period leading up to the crisis, and it will return to a more sustainable pace. Third, the slower growth in the labor force due to the declining fertility rate will gradually temper long-run growth. Lastly, the continued upgrading of human resources will help boost growth, but its positive effects will be unlikely to offset the above downward factors.

Policy efforts to address the structural weaknesses revealed by the Asian crisis would make a difference in realizing renewed growth in the longer term. According to the simulation results, if complacency should weaken such policy efforts, the growth of the Asian economies hardest hit by the crisis would be lowered by about 2.3% a year in the coming years.

The above projection results are based on rigorous econometric work. The main tool is the estimation of the meta-production function for APEC economies, measuring the long-run properties of the growth process in the region. This special type of production function captures the economic growth process in a variety of economies in different developmental stages in one common production function, and explicitly estimates the differing levels of production efficiency gauging how efficiently each economy utilizes capital and labor inputs in its production activities.

The estimated production function reveals that many APEC developing economies still lag substantially behind APEC developed economies in terms of production efficiency, but they have managed to steadily improve it over time. For example, Asian NIEs and the ASEAN economies have raised production efficiency by 2.9% and 1.2% a year respectively over the past three decades, as compared with only 0.4% of efficiency gains in APEC developed economies over the same period. The advantage of this approach for projection is to provide a solid analytical basis for scenario making as to the progress of structural policy efforts on which the pace of efficiency improvement hinges. In addition, another type of production function based on the convergence theory is also used to complement and underpin the projection results obtained from the meta-production function.

In conclusion, the projection results indicate that APEC economies still have good potential to continue to grow dynamically over the next decade, further narrowing income gaps among member economies. They also underline the significance of undertaking structural policy efforts to meet the challenges for future growth.

Table 1. Projection of Economic Growth in the APEC Region

(Annual real GDP growth rates, in percent)

	APEC Total	APEC Developed Economies	APEC Developing Economies		
				NIEs	ASEAN
Projection (2000-2010)	2.7	2.1	5.4	5.3	6.1
Actual (1990-1996)	2.8	2.0	6.4	6.8	7.2

Future trade in the APEC region

As APEC economies regain their dynamic growth over the next decade leaving the Asian crisis behind, trades in the region will likely develop dynamically. Changing trade patterns are projected in line with the growth projection discussed above, based on econometric simulation work using the computable general equilibrium (CGE) model. The CGE model is a standard analytical tool for long-run projection, encapsulating the dynamic inter-linkage of the world economy.

Table 2 shows the projection results. Total trade (measured by exports) of APEC economies will expand at 6.9% a year over the next decade through to the year 2010. They will significantly outpace the growth in the world's total trade (3.6% a year), growing nearly twice as rapidly. As a result, the share of APEC trade in the world will be 66 % in 2010, rising from 47 % in 1999.

As total trade of APEC economies expands strongly, intra-regional trade (trade among APEC economies) will also outpace APEC trade with non-member economies in the world. In fact, 69% of the growth in APEC's total trade will come from intra-regional trade. The open trade regimes of APEC economies contribute to further deepening of interdependence in the APEC region. A virtuous circle will set in between growth and trade in the APEC region. Namely, future strong economic growth will promote dynamic growth in trade, not least in intra-regional trade, and the trade dynamism in turn underpins future growth.

The composition of trade will inevitably undergo dynamic changes. For example, exports of transportation equipment (automobiles and auto-parts) and electrical/electronic products from some APEC developing economies in Asia will expand substantially over the next decade. This will reflect a dynamic transformation in industrial structure in these economies, leading to major changes in the international division of labor within the APEC region.

The above projection results incorporate on-going APEC efforts for trade liberalization under the *Bogor* goal. For the purpose of this projection, it is assumed that APEC developed economies will eliminate tariffs by 2010, and APEC developing economies will halve tariffs prevailed in 1995 by 2010. These trade measures will further boost trade of APEC economies, with the estimated additional trade of $173 billion a year. Note that total trade of APEC economies in 1999 was $2,649 billion. Among APEC economies, developing economies are more likely to obtain greater benefits from APEC trade liberalization.

Table 2. Projection of Trade in the APEC Region

(Annual export growth rates, in percent)

	APEC Total	World Total
Projection (2000-2010)	6.9	3.6
Actual[1] (1990-1996)	10.1	7.7

Note: Not including exports of services.
Data is from IMF, International Financial Statistics.
Export growth is measured in nominal terms.

INDIVIDUAL REPORTS

Individual Report I (Japan)

Growth Potentials of APEC Economies beyond the Asian Crisis

(Contents)

Growth Potentials of APEC Economies beyond the Asian Crisis

The Asian Crisis from mid-1997 onwards inflicted devastation on a number of developing APEC economies in East Asia. The crisis-affected economies are now recovering rapidly and to such an extent that the Asian Crisis appears to have become a thing of the past. However, it would be cavalier to think that the Asian Crisis was just a hiccup and Asian economies can coast along in the coming years. It is important to note that the Asian crisis had shed light on a number of structural weaknesses in Asian economies, and many other APEC economies share similar weaknesses, albeit to varied extents. There can be no denying that long-term growth prospects hinge on how such structural weaknesses are addressed, and here most of the challenges posed by the Crisis still remains to be met.

In the meantime, the phenomenal advance of information technology has posed both challenges and opportunities for all APEC economies. As did the "new" general-purpose technologies of the past such as the steam engine and electric power, information technology holds the promise of raising productivity economy-wide with pervasive impacts on all sectors. Information technology has the potential to usher in the "new economy", in which long-term growth is raised by productivity gains triggered by the advance of information technology. As the new era of the "new economy" and the knowledge-based economy unfolds, entrepreneurship has taken on renewed importance. Fostering entrepreneurship has become an effective way to promote economic growth and employment.

This study looks into growth potentials of APEC economies in the long run. It comprises two parts. Part I examines the factors shaping the future of APEC economies and outlines likely scenarios of economic growth in the next decade based on econometric work. Part II considers the role of government in fostering entrepreneurship and lays out options for public policies.

PART I. ASSESSING FUTURE GROWTH OF APEC ECONOMIES

1. Introduction

Developing economies in East Asia has been praised for their spectacular macroeconomic performance. The praise is well deserved, these economies were able to record high growth with low inflation for a number of decades[1]. Their performance stands out when compared to the records of developing economies in other regions. High growth has also been accompanied by a rising share of trade and investment among the economies within the Asia-Pacific region. Such deepening of interdependence in the region was the background to the initiative to form the Asia-Pacific Economic Cooperation (APEC), as a framework for regional cooperation.[2]

High growth came to an abrupt halt in July 1997 when the Thai baht was floated and the curtain of the Asian Crisis was raised. The crisis quickly spread to other economies in the

[1] The experience of these economies is often referred to as the "Asian Miracle", following World Bank (1993).

[2] An analysis of the macroeconomic performance of, and of the deepening of intra-regional dependency among the Asia-Pacific economies can be found in APEC (1995).

region, and further to Russia and Latin American economies. The crisis-affected economies, particularly in Asia, were devastated by the sharp devaluation of their currencies, grave contraction of domestic demand, and the collapse of domestic financial systems. Rises in inflation and unemployment quickly intensified social tension. It also had a significant impact on trade and investment in the region, resulting in the impact of the crisis being transmitted around the world. The process of overcoming the situation, with supports from the international financial institutions and some individual economies, was a painful one. The sharper the adjustment, however, the quicker the recovery. Following a return to positive growth in 1999, GDP forecasts for the crisis-affected economies indicate stronger growth in 2000 for all of them.[3]

During the days of high growth, few had expressed doubts about the future growth of East Asian economies. An important exception may be a view that expressed concern about the input-driven nature of their growth, which would sooner or later meet with diminishing returns. This view, however, was on the long-term prospects for growth; it did not expect such a sudden halt to current high growth.[4]

It was natural, therefore, for economists to start producing a host of studies discussing the Asian Crisis. One of the most popular themes was the causes of the crisis.[5] Pinning down the causes would help prevent future crises. Another popular theme was the policy response to the crisis.[6] At the center of debate was whether the prescription by the IMF of tight fiscal and monetary policies had been appropriate, and what could have been the alternative.

In contrast to the studies on these popular themes, there have been relatively few studies on the implications of the Asian Crisis for long-term growth prospects. However, it is important for both the global economy as well as for the Asia-Pacific community to have an assessment of the long-term growth prospects for the East Asian developing economies, and the Asia-Pacific region as a whole, in the post-crisis era. Will the crisis-affected economies, having recovered from the post-crisis downturn, resume high growth similar to that achieved prior to the Asian Crisis? Or will the economies face slower long-term growth in the aftermath of the crisis? These are the kind of issues that are of interest, and what this component of the Project attempts to address.

The study in Part I is organized as follows. Following this introduction, section 2 discusses the relationship between crises and long-term growth in the past. It emphasizes the importance of looking into the fundamental determinants of growth–supply-side growth potentials and the economic system of the economies. Section 3 examines the supply-side growth potentials, and section 4 the economic system. Section 5 discusses entrepreneurship, which is a key factor in the economic system that would enable economies to achieve a successful shift to a knowledge-based economy. On the basis of the preceding discussion about growth prospects, growth projections are provided in section 6 using of two different econometric approaches. Finally, section 7 offers some concluding remarks.

[3] See for instance IMF (2000).
[4] See Krugman (1994) and Krugman (1998).
[5] See, for instance, Goldstein (1998), Krugman(1998), Radelet and Sachs (1998), Furman and Stiglitz (1998), Berg (1999) and Feldstein (1999).
[6] See, for instance, Corden (1998) , Feldstein (1998), Furman and Stiglitz (1998), and Lane et al.(1999).

2. Relationship between the Crisis and Long-term Growth

At the outset, it is important to clarify the relationship between a crisis faced by an economy and its long-term growth. In particular, is it important to acknowledge that evidence *does not* necessarily support the assertion that a crisis, with its devastating negative impacts on the economy, will harm growth potentials and thus be followed by lower growth in the long-term.

For example, when a long-term time-series data on per capita real GDP is examined for developed economies, crises are not necessarily followed by slower growth than that in the periods preceding the crises. In the case of the United States, the financial crisis in 1929 that led to a sharp drop of output in the following years does not seem to have affected long-term growth, at least not in a negative way.[7] Even when we confine ourselves to financial crises in East Asian economies, we find that they have been subject to a number of crises in the 1980s; the Philippines in 1981-1987, Thailand in 1983-1987, and Malaysia in 1985-1988. Apparently, these crises did not prevent the Asian Miracle from taking place.

Furthermore, even if a crisis coincided with the start of a period of slower growth, the causality may not be running from the crisis to lower growth. For example, in Japan, there was a break in the long-term growth rate in 1974, which was also the year of the "Oil Crisis". The reason for the downward kink in economic growth, however, seems to lie in the fact that the economy had completed its "catching-up" with more developed economies, rather than in the negative impacts of the Oil Crisis on the economy. The same seems to apply to the case of the Asian Crisis. In Thailand, prices of residential properties, which had risen rapidly in the early 1990s, had started to nosedive in 1996, creating difficulties in the financial institutions that had directly or indirectly invested in the market. In Korea, a gradual decline of exports in the 1990s made it clear that the private/business sector had excess capacity. In these economies, it may well be the case that falls in economic growth preceded the outbreak of the crises.

These observations lead us to conclude that a crisis does not necessarily mean lower long-term growth in subsequent periods. In order to assess the growth prospects of the Asia-Pacific economies, therefore, we need to go back to the fundamental determinants of economic growth and examine whether significant changes have taken place in those areas. Fundamentals determinants of growth include: (a) supply-side factors of production, i.e., labor force, capital stock, and productivity; and (b) the economic system in which resources are mobilized, and put to use in production. Let us discuss them in turn.

3. Growth Potentials of East Asian Developing Economies

It has been acknowledged that East Asian developing economies enjoyed rich growth potentials.[8] Is the situation expected to change after the Asian Crisis?

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[7] It is based on a comparison of per capita real GDP growth rate between 1860-1929 (annual average of 1.77 percent) and 1955-1989 (annual average of 1.85 percent). The 1929-1955 (annual average of 2.13 percent) is omitted in order to take into account the possible influence of the Second World War. See Ben-David, Lumsdaine, and Papell (1998).

[8] For recent analyses on the sources of growth in East Asia, see Young (1995), Collins and Bosworth (1996), Sarel (1997), and Crafts (1999).

Labor force growth has made a relatively strong contribution to growth in East Asia, accounting for about one third of economic growth in the last few decades. It results from high population growth, and has provided an ample working-age population. The achievement of higher levels of income, however, is expected to reduce the fertility rate as well as extend life expectancy. As a consequence, the growth in working-age population is expected to fall in the long-term. The pace of this demographic change will be different across economies; the change is going to take place much faster in newly industralized economies (NIEs) than in ASEAN economies generally. Negative effects of the aging process on labor force growth will also be offset somewhat by a rise in the labor force participation rates of females and the aged. Nevertheless, the aging process will inevitably have an impact on the labor force growth rate. The International Labor Organization (ILO) projects that the average rate of labor force growth in 1995-2010 compared to that in 1980-1995 will fall from 2.3 percent to 0.9 percent in Thailand, from 2.3 percent to 1.3 percent in Korea, and from 2.9 percent to 2.1 percent in Indonesia.[9] The contribution of the labor input to economic growth will inevitably decline in the long-term.

Capital stock growth has also been strong in the last few decades. In fact, it has been a main source of growth during the period, accounting for about a half of all economic growth. The pace of capital accumulation in the 1990s, however, is not sustainable in the long-term. One of the reasons for the slowdown is the progress made in "convergence" – the narrowing of the gap between the economies' steady state level of capital and the actual level. Another reason is that a portion of investments in the 1990s was in industries that had excess capacity and projects with only low rates of return. These kinds of inefficient investment are doomed to fall in the long-term since improving the economic system to make use of savings more efficiently in capital accumulation has become an inevitable and necessary task.

A negative influence on investment can also be envisaged by a fall in the private savings rate that is expected to take place as the aging of the population sets in. Similarly, a negative influence may also come from the possible decline in the public savings rate. However, estimates on the future trend of the savings rates show that the national saving of NIEs would fall immediately, while that of the ASEAN economies would not start to fall until after 2010.[10] Furthermore, when these economies successfully regain confidence in the international community about their future performance, particularly by reforming their economic systems, access to foreign savings should improve. It would be too pessimistic, therefore, to expect that availability of savings would constrain future capital accumulation. In sum, the contribution of capital inputs to their economic growth can be expected to remain vigorous, although the extent of that contribution depends on the changes that are made to their economic systems.

Productivity gain has not been so strong in East Asia, accounting for no more than 20 percent of economic growth. This is, however, a pattern that has been followed by developed economies at their early stages of development. A shift of the pattern of growth to one that relies more on productivity gains is expected in the long-term. Generally speaking, productivity gains consist of: (a) technological progress, meaning advancement in the best practice technologies, which pushes the production frontier outward; and (b) efficiency improvement, achieved by adapting to the latest technologies and making more efficient use of factors of production, thereby moving closer to the production frontier. In

[9] From the projection of economically active population in ILO (1998).
[10] Heller and Symansky (1997).

the case of East Asian developing economies, the greatere scope for productivity gains exists clearly in the latter.

There are several reasons for expecting a considerable contribution to productivity growth from efficiency improvements. First, there is still a significant gap between the efficiency levels of these economies and those of the developed economies.[11] Productivity can be improved by catching up to the best practice technologies. Second, the catching-up process will benefit from outward-oriented policies that East Asian economies have long been pursuing. These policies facilitate imports that embody latest technologies, and foreign direct investments that mediate the transfer of technology. It is important in this regard that commitments to outward-oriented policies be maintained and further strengthened. Third, catching-up will also benefit from the rich accumulation of human capital in East Asian economies. It forms an important part of the capability adopting and developing newly-introduced technologies. It is important, in this sense, that these economies maintain momentum toward investment in education and training, by both the private/business and public sectors. Fourth, strengthening the functioning of markets should raise productivity. Efficient markets will help improve productivity by allocating resources to more efficient and productive use, and by stimulating competition that will lead firms to invest more in research and development, and develop efficiency-enhancing technologies and know-how. These reasons lead us to conclude that productivity gain can be a major source of growth in the region in the long-term.

To sum up, East Asian developing economies are still expected to enjoy rich growth potentials, albeit at somewhat slower pace. The issue then becomes whether the growth potentials can be maximized, and whether growth potentials can be materialized, leading to actual strong growth. The outcome depends on, to a large extent, what the economic system would be like in these economies.

4. Structural Weaknesses Revealed by the Crisis

The Asian Crisis revealed that the economic system of East Asian economies had embedded weaknesses that would become, and in some cases already had become, obstacles to growth. These structural weaknesses existed in a wide range of areas.

Weaknesses in *the financial sector* attracted most attention. One of the most fundamental weaknesses was the dominance of banks in channeling savings to the private/business sector. The banks were building a large interest in the private/business sector, and the stability of the financial system became increasingly dependent on the viability of this sector. The banks were able to make such lending because of the lack of a developed capital market, and also because of the lack of adequate financial supervision and regulation. The latter was not established even after the liberalization of domestic financial systems and external borrowing. There seems to have been problems in designing the sequencing of reform measures.

The *private/business sector*, which relied on bank borrowing as one of its main sources of funds and which saw a significant rise in its debt to equity ratio, was investing larger portions of its funds in real estate and in industries with excess capacity. The efficiency of

[11] According to our estimates that will be presented later in the paper, the level of efficiency in 2000 will be about 13 percent lower in NIEs, and 52 percent lower in ASEAN than that of the APEC developed economies.

these investments was clearly deteriorating, but the problems relating to them did not become evident while asset price inflation and high growth continued. The private/business sector was becoming highly vulnerable to changes in economic trends. Such poor investment decisions were made possible by weak corporate governance and lack of appropriate risk management. Investment decisions had to be made in an environment where investment opportunities were distorted by such factors as protection of domestic markets, existence of government guidance, and lack of competition policy.

The weaknesses in the economic systems were amplified by the *external policy setting*. The main policy measures that are relevant in this context include: deregulation of capital mobility; facilitation of external borrowing; and commitment to a fixed exchange regime. It fueled further funds into the system, which aggravated the vulnerability of the financial and private/business sectors. Furthermore, additional vulnerability was created by the capital inflows because of their short-term nature and the fact that they were mostly unhedged. The accumulation of short-term external debts relative to foreign reserves made economies increasingly susceptible to changes in international investors' perceptions.

Other structural weaknesses were revealed during the adjustment phase of the crisis. In particular, *safety net and other institutional framework* or the lack of it, was such that it was extremely difficult to make adjustment and restructuring. Reform of the banking sector was constrained by the lack of a deposit insurance scheme. The closing down of non-viable firms was severely hampered by the lack of bankruptcy and foreclosure laws. Restructuring of firms was made difficult because of inflexibility in the labor market. The workers who became unemployed were subjected to considerable suffering because unemployment insurance schemes were not in place.

The Asian Crisis made it clear that structural weaknesses had become an obstacle to further growth. Even if the crisis-affected economies had not been hit by the crisis, high growth could not have been sustained for a long time. By the same token, those economies that were not hit by the crisis will not be immune from a slowing-down of growth as long as structural weaknesses are left untouched. Implementing structural measures addressing the weaknesses is an important challenge that APEC economies must face in order to enjoy strong long-term growth.

5. Entrepreneurship and Economic Growth

At a time when they have to address the challenge posed by the Asian Crisis, APEC economies are also facing another important challenge that needs to be met in order to achieve dynamic and robust growth in the twenty-first century. It is the challenge to adapt to the new environment which is emerging globally and rapidly. This new environment is often characterized as the "knowledge-based economy."

A knowledge-based economy is based on the power of ideas that create economic values. In such an economy, increasingly more and more value added is produced by the quality and quantity of information and knowledge used than by traditional inputs of production. In this respect, a shift towards a knowledge-based economy, has been taking place for some time. The automobile industry, for instance, is a typical manufacturing sector in which higher value added has been produced by branding and design. A more widespread and significant shift, however, is expected to take place in the coming years so that

invention and using knowledge and ideas will become vital sources of economic growth, employment, corporate profitability, and higher living standards.

The driving force of the recent rapid shift to knowledge-based economy has been the IT (information technology) revolution. The phenomenal advance of IT has led to the creation of new business opportunities in the areas of hardware, software, and their related services. In addition, people have come to enjoy consumption of knowledge *per se* in the form of information and communication separate from goods and services. In other words, in today's economy, knowledge has become a valuable output as well as an important input for the production of almost all goods and services.

Entrepreneurship is the ability to mobilize resources in order to benefit from new, perhaps uncertain, business opportunities. In this sense, entrepreneurship, has been at the center of economic growth and employment ever since the industrial revolution in the eighteenth century. The significance of entrepreneurship, however, has increased as the economy has become more knowledge-based.

As knowledge has become more important, the pace of change has quickened. Accordingly, entrepreneurial traits such as innovative ideas, individual initiatives, adjustability, and speed in making decisions, have also become more important. In particular, the knowledge-based economy provides ample scope for entrepreneurial individuals and small firms to nimbly outmaneuver their larger competitors, which tend to take time to make decisions and often stifle innovative ideas in their hierarchical decision making processes.

In this respect, vigorous entrepreneurship in general, and the active creation of new firms in particular, are vitally important in maintaining dynamic momentum in a knowledge-based economy[12]. The significance of entrepreneurship in the economy, however, seems to differ widely across economies in the APEC region. A survey[13] shows that, among about fifty major economies in the world, Hong Kong, China and Chinese Taipei ranked at the top, while Japan was at the very bottom. Efforts to foster entrepreneurship are particularly needed in economies where it is currently limited and inactive.

Structural measures in the APEC economies, therefore, should serve to help the economies in fostering entrepreneurship, and in adapting to and benefiting from the knowledge-based economy. Structural measures that may serve to foster entrepreneurship are outlined in Part II.

6. Projection of Long-term Growth

This section provides a set of projection on the long-term growth potentials of APEC economies after the Asian Crisis. The projections are not intended to be precise forecasts, which are difficult to produce when considerable uncertainty exists. Instead, what is produced is a set of simulations under certain scenarios. It is designed not only to provide a quantitative basis for discussions on economic issues in the post-Asian Crisis era, but also to underline the importance of pursuing full-implementation of structural measures.

[12] It is difficult empirically to find a positive correlation between entrepreneurship and economic growth. The reasons for it seem to lie in the difficulty to control for other factors affecting growth, as well as the difficulty in finding appropriate indicator of entrepreneurship.
[13] International Institute of Management Development (2000).

The approaches that have been chosen are *the meta-production function approach* and *the conditional convergence model approach*. The following summarizes the main features of the two approaches, the results of their estimations, and the projections they provide.

6.1 Meta-Production Function Approach

a) Main Features

The meta-production function approach[14] is an attempt to explicitly estimate the production function underlying economic growth in APEC economies. Compared to other estimates of production function, the meta-production function approach has the following features: It assumes that (i) all economies under consideration are subject to the same production function, and that (ii) each economy (or groups of economies) differs in the efficiency with which they utilize their inputs. This approach makes it possible to compare the level and the speed of improvement in efficiency among the economies concerned: The economies with the highest efficiency can be identified as the best practice economies, and others can be considered to be in their process of catching up to them. Because of this feature, this approach is convenient in making projections under different scenarios based on different speed of efficiency improvement. The estimated equation is:

$$(1) \qquad \ln Y_{it} = const. + \beta_1 \ln K_{it} + \beta_2 \ln L_{it} + \chi_i A_i + \psi_i T_i + \omega_j D_j ,$$

where Y_{it} denotes real GDP, K_{it} capital stock, L_{it} employment in categories of economy i at time t; and A_i and T_i denote constants and time trends, respectively, specific to the categories of economies i. The estimated coefficients of K_{it} and L_{it} correspond to the factor income shares of capital and labor, respectively. A_is and T_is are included to capture the initial efficiency level and the speed of efficiency improvement, respectively, specific to the categories of economies i. D_js are dummy variables included in order to take into account various factors specific to certain economies and the effect of the banking crisis that took place in Latin America.

The estimation is made using panel data of APEC economies, each having annual data for the period 1970-1997. The number of economies that satisfy the data requirement is thirteen, and they are grouped into four categories of economies; APEC developed economies, APEC Latin America, NIEs, and ASEAN[15]. Each APEC economies, for which the data necessary for the estimation is available, has been included. The data is taken from the Penn World Table[16], and updated up to 1997 by statistical information from the IMF, OECD, and the authorities of respective economies. The random-effect panel-data estimation method is used for estimation.

[14] Meta-production function was developed by Hayami and Ruttan (1970) and applied empirically by, among others, Lau and Yotopoulos (1989), and Boskin and Lau (1992).

[15] APEC economies included are; *the APEC developed economies* consisting of Australia, Canada, Japan, New Zealand, and the United States; *APEC Latin America* consisting of Chile, Mexico, and Peru; *NIEs* consisting of Hong Kong, China; Korea; and Chinese Taipei; and *ASEAN* consisting of the Philippines and Thailand.

[16] Based on the Penn World Table, Mark 5.6, available from the website of the National Bureau of Economic Research. It is an updated version of the older one included in Summers and Heston (1991).

b) Estimated Results

The estimated results are summarized in Table 1. They show that the initial levels of efficiency of NIEs and ASEAN in 1970 were 44 percent and 38 percent, respectively, of that of the developed economies[17]. They also show that the rate of efficiency improvement of the developed economies, NIEs, and ASEAN are 0.4 percent, 2.9 percent, and 1.2 percent per annum (p.a.), respectively[18].

The estimated rates of efficiency gains are roughly in line with estimates obtained in other studies, as Table 2 shows. It confirms that the efficiency of NIEs and ASEAN, which were both far behind that of the developed economies in 1970, had been catching up rapidly during the period prior to the Asian Crisis.

Table 1. Meta-Production Function Approach: Estimated Parameters

Constant	K	L	A (LA)	A (NIEs)	A (ASEAN)	T (Developed)	T (NIEs)	T (ASEAN)
2.2305***	0.4238***	0.5336***	-0.2878	-0.8155***	-0.9702***	0.0036***	0.0285***	0.0119***
(0.3257)	(0.0197)	(0.0431)	(0.2116)	(0.2137)	(0.2458)	(0.0011)	(0.0015)	(0.0014)

D1	D2	D3	D4	D5
-0.0780**	-0.2532***	-0.0639**	-0.1027***	-0.1190***
(0.0329)	(0.0367)	(0.0308)	(0.0335)	(0.01861)

Number of Observations=13x28; R-square Overall=0.9829; Chi-square=12045.06***.

Notes:

1. Figures in parentheses are standard deviations. "***","**" and "*" show statistical significance level at 1 percent, 5 percent, and 10 percent, respectively.
2. D1 is for Peru in the 1980s, D2 for Peru in the 1990s, D3 for NZ in the 1980s, D4 for NZ in the 1990s, and D5 for the banking crisis in Latin America.
3. T (Developed) is for Australia, Japan, and the US.

[17] Since the initial levels of efficiency of the developed economies are assumed to be unity (its logarithm thus becomes zero), relative levels of efficiency of NIEs and ASEAN can be derived by taking the exponential of the coefficients of the "*A"* s (e.g. exp (-0.8155) = 0.44).

[18] Both values for APEC Latin America turned out to be both statistically insignificant, and are, therefore, not presented here.

Table 2. Comparison of Estimated TFP Growth Rates

(Annual rates, in percent)

Authors	World Bank (1993)	Young (1995)	Bosworth & Collins (1996)	Sarel (1997)	Our Estimates
Period	1960-89	1966-90	1960-94	1978-96	1970-97
NIEs					2.9**
Hong Kong, China	3.5	2.3*	---	---	---
Korea	3.1	1.7	1.5	---	---
Singapore	1.9	0.2	1.5	2.2	---
Chinese Taipei	3.8	2.1	2.0	---	---
ASEAN					1.2***
Indonesia	1.3	---	0.8	1.2	---
Malaysia	1.1	---	0.9	2.0	---
Philippines	---	---	-0.4	-0.8	---
Thailand	2.5	---	1.8	2.0	---
Developed					0.4****
United States	---	---	0.3	0.3	---
Japan	3.5	---	---	---	---

Note:

* period is 1966-1991;

** covers Hong Kong, China; Korea; and Chinese Taipei;

*** covers the Philippines and Thailand; and

**** covers Australia; Canada; Japan; New Zealand; and the United States.

c) Growth Projections

On the basis of the estimated meta-production function, growth projections have been made for each category of economies in the period 2000-2010[19]. They are based on a scenario which assumes that APEC economies would be successful in implementing the structural measures that are required to address structural weaknesses and to foster entrepreneurship.

They assume that the future values of labor input, L_{it}, will follow the projection by the International Labor Organization[20]. They also assume that the future values of capital input, K_{it}, will be consistent with those implied by the growth theory, and will be determined by such factors as population growth rate, the speed of efficiency improvement, and investment/GDP ratio[21].

The rate of efficiency improvement in NIEs, including Korea, is assumed to remain high at 2.9 percent, though the rate would have to match that of the developed economies once their efficiency level reaches that of the developed in the projection period. The rate in ASEAN economies is assumed to rise to 3 percent from the past rate of 1.2 percent. The rate of efficiency improvement of APEC Latin America is also assumed to rise to 1 percent. The speed in APEC developed economies, is assumed to stay at 0.4 percent.

[19] Making use of the estimated parameters, projections were also made for Brunei, China, Indonesia, Malaysia, Papua New Guinea, Russia, Singapore and Vietnam (all included in *developing economies*, with Singapore further belonging to *NIEs*, Brunei, Indonesia, Malaysia, and Vietnam in *ASEAN* categories.). The projection, therefore, covers all APEC member economies.

[20] Included in ILO (1998).

[21] In other words, it was assumed that they follow the paths suggested by the transitional dynamics of a Solow growth model.

Finally, it is also assumed that the investment/GDP ratios will stay high at the average value of the period 1970-1997 for all APEC member economies except NIEs and the ASEAN economies which would maintain the average value of the period 1985-1997.

On these assumptions, a couple of points are worth noting. First, the rate of efficiency improvement in NIEs and ASEAN economies is set in order to incorporate the expected impact of successful implementation of structural measures on them. While concrete measures are not specified, they should include measures that address structural weaknesses, as suggested in section 4, as well as measures that foster entrepreneurship, as outlined in Part II.

Second, the rate of efficiency improvement of APEC developed economies is set at the estimated rate for the period 1970-1997. An alternative would be to assume a higher rate in view of the higher productivity growth witnessed in the United States since 1995[22]. The alternative is not adopted for this projection because of the difficulty in interpreting the experience into a quantitative assumption for the projection. This, in turn, is due to the uncertainty in the durability of such a pick up, and the extent of the diffusion of it to other economies[23].

Table 3. Meta-Production Function Approach: Main Projection

(Annual real GDP growth rates, in percent)

	APEC Total	APEC Developed Economies	APEC Developing Economies	NIEs	ASEAN
Projection (2000-2010)	2.7	2.1	5.4	5.3	6.1
Actual (1990-1996)	2.8	2.0	6.4	6.8	7.2

[22] For analyses of the higher productivity growth witnessed in the United States since 1995, see Gordon (2000), Jorgenson and Stiroh (2000), and Oliner and Sichel (2000).

[23] More specifically, the alternative assumption was not adopted because of the following reasons. First, it is not clear whether the recent pick up in productivity growth reflects a permanent increase in productivity growth, or a temporary rise due to a one-time shock to productivity level. Second, higher productivity growth is observed mainly in the industries producing computers, software, and communication equipment. In contrast, industries that use information technology extensively have seen little change in productivity growth, in spite of heavy investment in them. Productivity growth in the future, therefore, depends significantly on the prospect of further technological progress in these information technology-producing industries. Finally, it is difficult to gauge the impact of information technology on productivity growth in other economies on the basis of the US experience. It is especially so in view of the difference in the size of information technology-producing industries, and the expected lag between development of such industries and realization of higher productivity growth.

The projection result is summarized in Table 3. It shows that rapid improvement in efficiency and the high level of investment enable the growth rate of real GDP to remain high, only marginally lower than the growth rate achieved during the period 1990-1996[24].

The result of the projection is encouraging since it shows that APEC economies can still expect to enjoy rich growth potential. Even this projection could turn out to be a conservative one if the recent pick up in productivity growth due to information technology persists in the US and spreads further to other economies. The possibility constitutes an upward risk to the projection.

6.2 Conditional Convergence Model Approach

a) Main Features

The conditional convergence model approach[25] is based on the idea that there is a long-term tendency for per capita GDP of different economies to *converge*; the lower the level of initial per capita GDP is, the higher the growth rate of per capita GDP, and vice versa. The convergence is *conditional*, however, in the sense that it can be observed only when the differences in such factors as the levels of human capital stock and physical capital investment are controlled for[26]. This approach provides projections that show economic growth achieved when economies continue to follow the conditional convergence path observed in the past. That being the case, the approach is not necessarily suitable for making projections under alternative scenarios with respect to policy options. Projections made by this approach, therefore, should be regarded as reference projections. The estimating equation is of the following form;

$$(2)\qquad \frac{\dot{y}}{y} = const. + \beta_1 \ln(RPGDP) + \beta_2 \ln(POPG) + \beta_3 \ln(SCHOOL) + \beta_4 \ln(INVR) + \chi_i (CATEGORY_i),$$

where $\frac{\dot{y}}{y}$ denotes the average annual growth rate of per capita real *GDP* during the period 1970-1990; *RPGDP* the level of per capita GDP relative to that of the US in the initial year of 1970; *POPG* the average annual population growth rate during the period 1970-

[24] An alternative projection was made under a scenario in which implementation of structural measures in the crisis-affected economies (Indonesia, Korea, Malaysia, the Philippines, and Thailand) is assumed unsatisfactory. More specifically, it was assumed that the rate of efficiency improvement in Korea falls to 1 percent, and that in other crisis-affected economies to 0.5 percent. The investment/GDP ratios for the crisis-affected economies are also assumed to fall to the average of 1970-1985. The result of the projection is summarized in the following Table.

Table Meta-Production Function Approach: Alternative Projection
(Annual real GDP growth rates, in percent)

	APEC Total	APEC Developed Economies	APEC Developing Economies	NIEs	ASEAN
Projection (2000-2010)	2.6	2.1	4.9	4.6	3.3
Actual (1990-1996)	2.8	2.0	6.4	6.8	7.2

[25] Earlier works include Barro (1991), and Barro and Sala-i-Martin (1991,1992).
[26] For theoretical discussion of conditional convergence, see Barro and Sala-i-Martin (1995) and Romer (1996).

1990; *SCHOOL* the secondary school enrollment rate in 1970; the *INVR* the average investment/GDP ratio during the period 1970-1990; and $CATEGORY_i$ dummies to capture effects specific to the category of economies *i*. The equation is estimated on pooled data of 104 economies, including almost all of APEC economies. The five categories of economies that are used for the estimation are; the developed economies, Latin America, NIEs, ASEAN, and Africa[27].

RPGDP enters the equation to check whether the conditional convergence mechanism is really at work; *POPG* enters to take into account the effect of population growth on per capita GDP growth. *SCHOOL* and *INVR* are included in order to control for these factors so that the existence of conditional convergence mechanism can be checked. The data is taken mainly from the World Bank database[28], and ordinary least squares is employed as the estimation method.

b) Estimated Results

The estimated results are shown in Table 4. Most of the coefficients are significant and have the expected signs. In particular, the negative and statistically significant coefficient on *RPGDP* confirms the existence of the convergence mechanism. The positive and significant coefficient on *SCHOOL* also confirms the importance of human capital on growth[29].

Table 4. Conditional Convergence Model Approach: Estimated Parameters

Constant	RPGDP	POPG	SCHOOL	INVR	LA	NIEs	ASEAN	AFRICA
0.034***	-0.005***	-0.004**	0.005***	0.021***	-0.010**	0.042***	0.011	0.008*
(0.012)	(0.001)	(0.002)	(0.002)	(0.005)	(0.004)	(0.007)	(0.007)	(0.004)

Numbers of Observations=104; Adjusted R-square=0.567; F-statistics=17.877***.

Note: Figures in parentheses are standard deviations. "***","**" and "*" show statistical significance level at 1 percent, 5 percent, and 10 percent, respectively.

c) Growth Projection

Making use of the estimated equation, average growth rates of GDP for the period 1995-2015 are projected for each category of economies[30]. For the projection, *RPGDP* and *SCHOOL* are given their 1995 values. Furthermore, the following is assumed: (i) *POPG* follows the projections by the World Bank[31], which reflect the demographic consequences of changes in fertility and mortality rates; (ii) *INVR* takes the value implied by the past trend except for Japan where an individual estimate was made[32]; (iii) *CATEGORY* dummy for NIEs, which had positive effect on growth in the past, would no longer be effective as

[27] APEC economies included are; *the APEC developed economies,* consisting of Australia; Canada; Japan; New Zealand; and the United States; *APEC Latin America* consisting of Chile; Mexico and Peru; *NIEs* consisting of Chinese Taipei; Hong Kong, China; Korea; and Singapore; *ASEAN* consisting of Indonesia; Thailand; the Philippines; and Malaysia; and *other APEC developing economies* consisting of China and Papua New Guinea.

[28] Included in World Bank (1998).

[29] The results are roughly in line with other estimates such as Barro(1991).

[30] Making use of the estimated parameters, projections were also made for Brunei, Russia, and Vietnam (both included in *APEC Developing economies*, and Brunei and Vietnam further belonging to the *ASEAN* category). The projection, therefore, covers all of the APEC member economies.

[31] Included in World Bank (1998)

[32] Generally speaking, trend was taken for the period 1965-1990. Due to data availability and feasibility of the estimated trend, however, trend for other period were taken for some economies.

the level of per capita GDP of NIEs would reach that of the developed economies in the projection period; and (iv) China and Vietnam would be at a stage where the *CATEGORY* dummy for ASEAN applies.

The projection result for APEC economies is summarized in Table 5. It shows that the long-term growth rate of real GDP would decline somewhat from that experienced prior to the Asian Crisis. The growth rates of NIEs and ASEAN economies in 1995-2015, for instance, fall to 3.8 percent p.a. and 5.6 percent p.a., respectively, from 8.3 percent and 6.7 percent, respectively, in the period 1975-1995. The main reason for the fall in growth rates is the slowdown in the speed of convergence in NIEs, which is a consequence of the rise in the GDP level. Decline in physical capital investment is also an important contributor to the fall in the growth rates. The fall in population growth also contributes in the decline in economic growth. The positive effect of human capital stock on economic growth proves to be insufficient to offset these negative effects on growth.

Table 5. Conditional Convergence Model Approach: Reference Projection

(Annual real GDP growth rates, in percent)

	APEC Total	APEC Developed Economies	APEC Developing Economies	NIEs	ASEAN
Projection (1995-2015)	2.8	2.3	4.9	3.8	5.6
Actual (1975-1995)	3.5	2.8	6.5	8.3	6.7

Note: The real GDP growth rates are obtained by multiplying per capita real GDP growth rates by population growth rates.

The above results are broadly in line with the projection provided by the meta-production function; APEC economies, particularly APEC developing economies, are expected to sustain firm economic growth, albeit at a slower pace than in the past. Especially notable is the growth of ASEAN economies, which is expected to exceed that of NIEs in the same period[33].

7. Concluding Remarks

The Asian Crisis has highlighted the structural weaknesses embedded in the economic systems of many APEC economies. In order to achieve robust long-term growth structural measures should be implemented so as to address such weaknesses.

The structural measures should also serve to help the economies in shifting towards knowledge-based ones. The key in this regard is to create an environment that will allow entrepreneurship to actively play its role. It should provide the main engine in achieving dynamic economic growth in the long-term.

The challenges facing APEC economies are not easy ones. The process of meeting the challenges may not be smooth. APEC economies should be confident with the prospects, however: As the projections show, they still are blessed with rich growth potential.

[33] Similarly to the projection obtained using the meta-production function approach, this projection does not incorporate the recent pick up in productivity growth witnessed in the United States since 1995, which is attributed to information technology. In this sense, the projection could turn out to be a conservative one.

PART II. PUBLIC POLICIES FOSTERING ENTREPRENEURSHIP

1. The Case for Fostering Entrepreneurship: Japan's Experience

The rapid advance of information technology and the growing importance of knowledge call for innovative ideas, individual initiatives rather than organizational discipline, adjustability, and greater speed in decision takings. As the new era of the new economy unfolds, entrepreneurship has taken on renewed importance. Entrepreneurship is the ability to marshal resources in order to seize new business opportunities which have uncertain outcomes. As such, entrepreneurship is central to economic growth, particularly in times of strong technological change.

Against this backdrop, there has recently been a growing interest in entrepreneurship in many APEC economies. Taking the case of Japan, the interest in starting new businesses among mid-career business people and fresh graduates has been growing notably in recent years. In fact, a number of new IT-related companies and other venture businesses has been on the rise. Over the past year, two new stock markets catering to new growth companies (Mothers and Nasdaq-Japan) have opened.

Yet, overall, the state of entrepreneurship remains dire in Japan. "The World Competitiveness Yearbook" published annually by the International Institute for Management Development (IMD) of Switzerland has put Japan at the bottom of its ranking on entrepreneurship. The creation of new firms in Japan has indeed remained very low, accounting for only 4-7% of the total number of firms over the past 15 years. By contrast, the US economy has actively created new firms, churning out about 15-17% of the total a year over the same period (Economic Planning Agency of Japan, 1999).

In an effort to reverse the disappointing trend, the Japanese government has recently introduced a variety of policy measures to foster entrepreneurship. Such measures include revising corporate laws concerning stock options and bankruptcy, deregulation aimed at enhancing labor market flexibility, expanding the availability of finance and advisory services for new companies through public financial and non-financial institutions, and changes in tax codes regarding investment in start-up companies and loss carryover for small companies.

This part considers options for public policies to foster entrepreneurship, referring to the experiences of Japan and some other economies. The grounds for taking such public policies will be also examined.

2. The Role of Government in Encouraging Entrepreneurship

Needless to say, the key drivers of entrepreneurial activities are private businesses, and private initiatives are central to entrepreneurship. Yet, governments have an important role to play in fostering entrepreneurship. The key role of government is to provide the right institutional and policy environment enabling entrepreneurship to flourish.

To the extent that entrepreneurship is instrumental in harnessing new technologies, it promotes productivity and economic growth. Furthermore, evidence indicates that entrepreneurship boosts employment. Over the past decade or so, smaller firms (including

newly-created firms) have been creating jobs, whereas larger firms have been removing jobs in major economies in the world (OECD, 1998). Fostering entrepreneurship has become an effective way to promote economic growth and employment. Priority consideration should therefore be given to public policies that encourage entrepreneurship.

First and foremost, governments need to provide an environment in which the market mechanism functions most efficiently. Entrepreneurship cannot flourish when markets are not competitive. Well-functioning markets can send the right signals for entrepreneurs as well as existing firms by mobilizing and allocating resources (human, financial, and physical) to their best uses. To that end, stable macroeconomic conditions are a precondition. Deregulation and trade/investment liberalization are also important in removing obstacles hindering the working of markets. It should be noted that government regulations often pose greater disadvantages on entrepreneurs than existing companies.

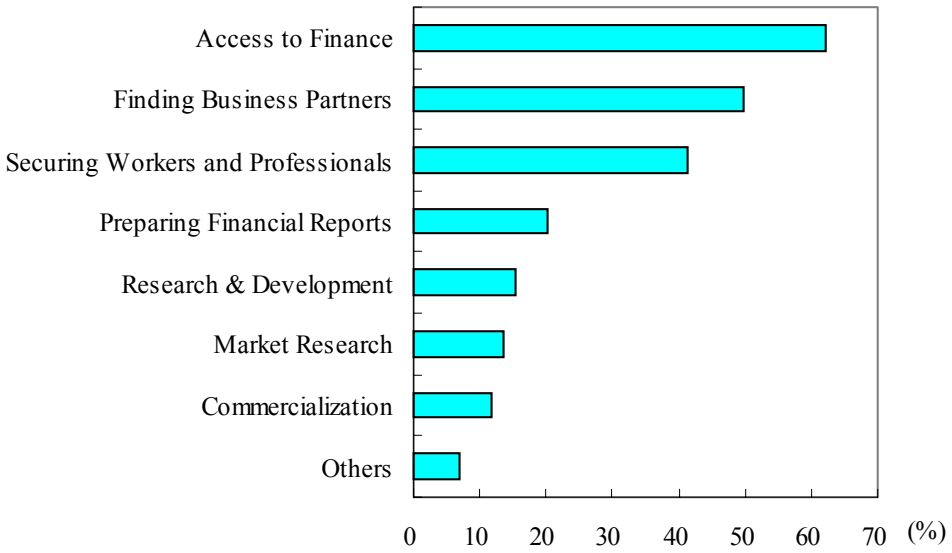
Second, governments need to review whether corporate laws, taxation, and other institutional arrangements do not unduly penalize risk-taking, because entrepreneurs take risks to seek new or unexploited profit opportunities. For example, unwieldy regulations on the use of stock options need to be removed, and bankruptcy laws need to strike the right balance between the protection of interests of lenders and investors and the ability of bankrupt owners to try again.

Third, governments have a role in education and technology development, which have "externality," yielding greater benefits to society than the benefits accrued to individuals. Governments need to revise as necessary rules and regulations on schools and universities with the aim of encouraging entrepreneurship education and life-long learning. There is scope for governments to facilitate university-company cooperation.

Furthermore, many governments assist potential entrepreneurs and new companies by providing advisory services and other business incubation services at no charge or at a subsidized cost, and by enhancing the availability of finance through public financial institutions. The idea is that governments need to complement markets in encouraging entrepreneurship with the aim of promoting growth and employment. There may be some grounds for such public intervention, although the costs and benefits of measures need to be gingerly weighed.

Against the background of the above discussions on the role of government, policy options for fostering entrepreneurship will be examined in what follows. Japan's recent survey asking small firms to identify major difficulties in starting up businesses provides a useful guide in identifying major areas that governments need to address. (See Figure 1.)

Figure 1.What Difficulties Japan's Start-ups Face



Note: The result of a survey in which entrepreneurs are asked what factors are most critical in making their business start-ups difficult. Multiple answers.
Source: Small and Medium Enterprise Agency, Government of Japan, *White Paper on Small and Medium Enterprises in Japan*, 1999

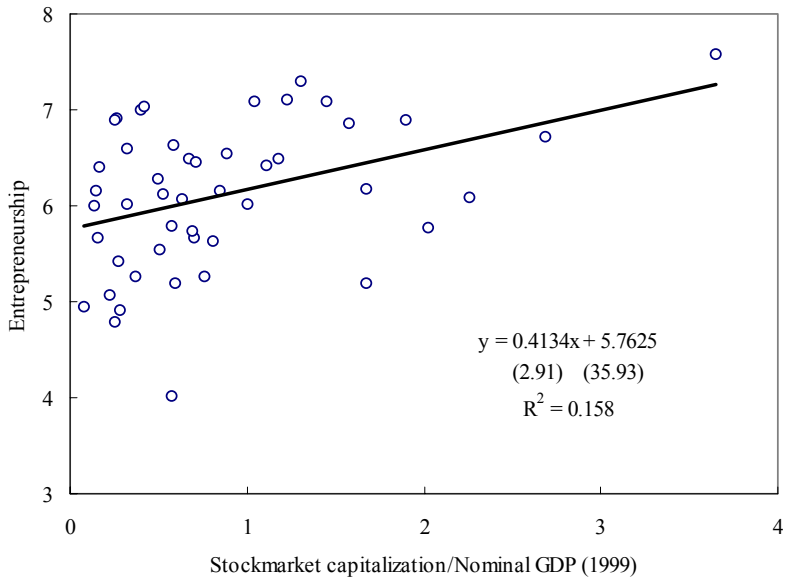
Policy measures in the following areas will be considered
1) access to finance,
2) human resources,
3) access to technologies and information,
4) legal infrastructure.

3. Expanding Access to Finance

Entrepreneurs are likely to face some extra difficulties in obtaining finance. There are limitations on bank loans to finance new companies since they often involve higher risks than loans to mature companies. In addition, new companies are likely have limited cash flow to service debts, and to lack collateral to cover loans.

Equity is a better source of finance than bank loans for many new businesses. Equity holders can share in profits when the new venture turns out successful, while banks (more generally debt holders) cannot benefit beyond the fixed interest payments. A statistical examination indicates that entrepreneurial activities are livelier in economies where stock markets are developed. (See Figure 2.)

Figure 2. Equity Finance and Entrepreneurship



Note: 1. "Entrepreneurship" is measured (0-10) by the IMD survey (2000), which asks top and middle executives in each of the 47 countries about various competitiveness conditions of the country.
2. "Entrepreneurship" shows how much sense of entrepreneurship managers generally have.
3. *t*-statistics are in parentheses. R^2 is adjusted.

Source: IMD, *The World Competitive®ness Yearbook*, 2000; OECD, *National Accounts*; IMF, *International Financial Statistics*, May 2000; Economic Planning Agency, Government of Japan, *Annual Report on National Accounts FY2000*

3.1 Equity Investment by Angels and Venture Capitals

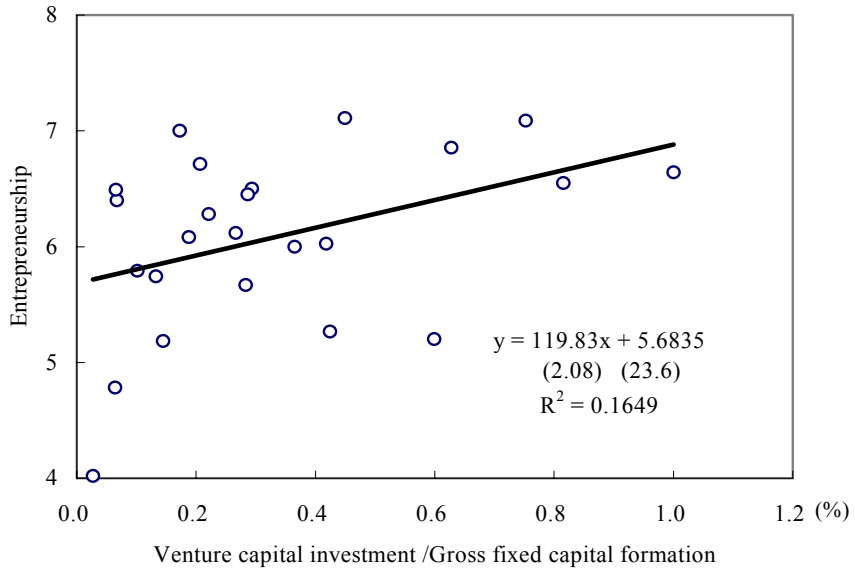
Generally, a new venture requires different types of equity finance as it grows. In the start-up stage, especially in the periods leading up to start-up and immediately after, an entrepreneur often needs relatively small amounts of funding which endure high risks. As the company grows and enters the "mezzanine stage" leading up to initial public offering (IPO), the risk endurance of funds becomes less important and the volume of funds in turn grows in importance.

In the US, most entrepreneurs start new businesses, by securing needed funds from their own savings, families, and friends. In the start-up stage and the early mezzanine stage, another important source of funds is "angels," who are wealthy individuals providing private equity funds in new ventures and who are often successful entrepreneurs themselves. In the mezzanine stage, venture capital firms play an important role. Venture capitals are financial intermediaries that pool risk-enduring funds from investors and make equity investments in young companies. Angels and venture capitals not only take significant financial stakes in young growing companies, but also provide them with business expertise which new entrepreneurs often lack. As the company grows further through the late mezzanine stage to IPOs, investment banks come to play a significant role in financing company growth.

To see the importance of equity finance in fostering new businesses, one can examine the statistical relationship between the availability of venture capitals in major economies and

the state of entrepreneurship as measured by IMD's "the World Competitiveness Yearbook." (See Figure 3.) There is indeed a positive relationship between the availability of venture capitals and entrepreneurship.

Figure 3. Venture Capital Investment and Entrepreneurship



Note: 1. "Entrepreneurship" is measured (0-10) by the IMD survey (2000).
2. Samples are 24 OECD countries.
3. *t*-statistics are in parentheses. R^2 is adjusted.

Source: IMD, *The World Competitiveness Yearbook*, 2000; OECD, *National Accounts*; IMF, *International Financial Statistics*, May 2000

One policy measure to foster equity funding to new business concerns income taxation on "angels" (individuals investing in new businesses.) Since angels earn most profits in the form of capital gains through IPO and M&A, their income from investment carries high risks. Reducing tax on the capital gains of angels may have positive effect on their behavior towards risk taking. Income taxation policies which allowed carrying losses forward would also encourage investments into such companies that carry higher investment risks. In Japan, a preferential income tax treatment for individuals investing in young companies (the "angels taxation") was introduced in 1997 and subsequently expanded in 2000. The U.S. introduced its angel taxation policy before 1997.

Another taxation measure helpful in fostering new businesses pertains to loss carryover in corporate income taxation. A newly-created company usually does not make profits for in its few years. Generally, the more innovative the company's product, the longer the lead-time for profits. That is because a new innovative company needs to invest heavily in R&D in the initial stage, and it also has to make greater efforts in developing a new market for its innovative product than entering an existing market. Some innovative start-ups, profitable as they may be in the long run, could be discouraged if corporate income taxation on an annual basis lowers its profitability. Thus, loss carryover provision during the early years of operation for new ventures may encourage the creation of new innovative firms. A study in the United States shows that it takes a lot longer, on average,

for an innovative start-up to post a profit and to clear accumulated debts, than less innovative start-ups (Bygrove and Timmons, 1993).

3.2 Tapping Stock Markets

In many economies, stock markets targeting new growth companies have been opened and developed. Such stock markets help young companies to raise equity funds from a wide variety of investors. They are also important as a channel of exit for investors like angels and venture capitals to harvest their investments and move on to other new opportunities.

The best-known such market is the NASDAQ (National Association of Securities Dealers Automated Quotation System) in the US, established in 1971. Over the last few years, new stock markets for new companies have started operations in APEC economies as well. Major examples include the KOSDAQ (Korean Association of Securities Dealers Automated Quotation System) in 1996; the Mothers (Market of the High-Growth and Emerging Stocks) in 1999 and NASDAQ-JAPAN in 2000 both in Japan; the GEM (Growth Enterprise Markets) in 1999 in Hong Kong, China; and the TIGER (Taiwan Innovative Growing Entrepreneurs) in 2000 in Chinese Taipei.

Initial public offerings (IPOs) on stock markets are an important way for angels and venture capitals to exit from their investments, reaping the capital gains and reinvesting in other budding companies. To this end, it is important for new promising companies to be able to achieve IPOs within reasonably short periods of time. In the US, it takes only about six years, on average, for a new company to make an IPO after its establishment. Given this relative ease of making IPOs, investors in the US can exit earlier, even before the IPOs, by selling their investments to other parties by way of mergers and acquisitions (M&A).

Thus, the recent opening of these new stock markets for new small companies in the APEC region is a welcome development for in fostering entrepreneurship. For such new stock markets to succeed, lowering listing requirements for ease of new listing must be accompanied by stringent rules for de-listing and tighter timely requirements for disclosure. That would enable investors to make informed decisions at their own risk. For example, unlike in traditional stock exchanges, in the NASDAQ in the US and other stock markets for new companies, it is possible for new companies as to be listed before they post any profits.

Since new companies have only limited numbers of shares for trade unlike large established companies, securing liquidity is of critical importance. To that end, market makers, who are securities companies (dealers) standing ready to buy and sell shares of particular companies at quoted prices, play an important role. In economies where market making is not as yet fully developed, it is important to develop conditions conducive to market making, including investor protection measures.

In many economies, financial institutions like pension funds and insurance companies are subject to various restrictions on their portfolios including caps on equity investments, with the aim of helping maintain prudence in investment. Such restrictions may need to be reviewed with the view to the need for enhancing equity finance for new businesses. In this regard, it is worth noting that, in the early 1970s, the US government relaxed the regulations on pension funds regarding equity investment in non-listed companies, leading the way to the subsequent rapid development of the venture capital industry in the US.

3.3 Financing by Public Financial Institutions

Equity finance, important as it is, cannot satisfy all the financing needs for new companies. Bank loans (and loans from other financial intermediaries) are an important source of finance for new companies as well. However, as mentioned earlier, there are some difficulties for banks wanting to extend loans to new companies, due to higher credit risks, lack of collateral, and limited cash flows.

In an effort to complement financing by the private/business sector, governments often make loans or equity funds available for new firms through public financial institutions. In many economies, there are a variety of programs including lending on preferential terms, co-financing with private banks by which public institutions aim at priming the pump, loan guaranty, and indirect equity investment through privately-managed investment funds. A successful case of public assistance for financing new businesses is the SBIC (Small Business Investment Company) program in the US. SBICs are the privately-managed venture capitals whose funds are partly provided by the federal government's Small Business Administration (SBA).

4. Mobilizing Human Resources for New Businesses

4.1 Flexible Labor Markets

Flexible labor markets are important to foster entrepreneurship, insofar as they enable new firms to secure competent workers and professionals and to respond quickly to changes in circumstances. They also work as a safety net, since they assure workers that, in times of business failure, entrepreneurs and their employees will be able to find jobs.

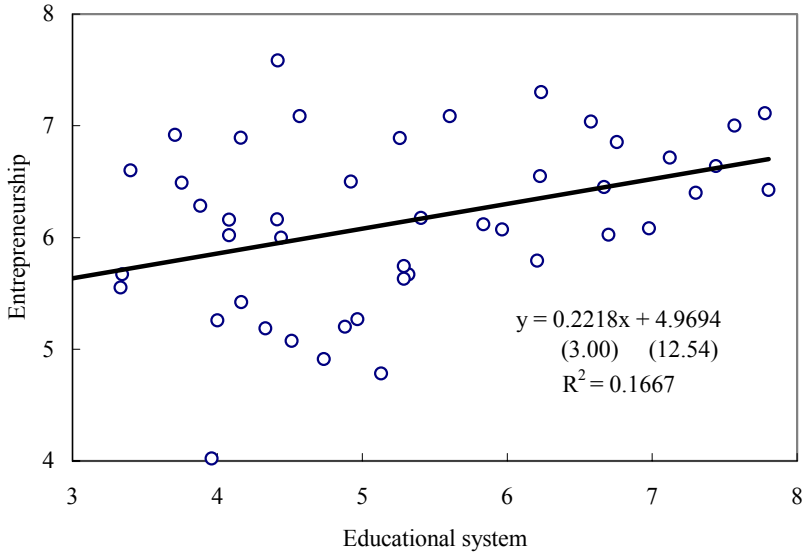
Therefore, deregulation in labor markets is important for enhancing the efficiency of the economy at large, and is vital for underpinning entrepreneurial activities. In Japan, the government has recently deregulated tight restrictions on the operation of job-placement companies and temporary-staff-dispatching companies.

The pension system, taxation, and other arrangements may have some effects which inhibit labor mobility. For example, when company pensions are not portable, workers may be discouraged from leaving secure jobs. Defined-contribution pension plans with individualized accounts have less distortion on workers' decision. Likewise, if companies provide generous fringe benefits like low-cost housing as part of wage compensation and such fringe benefits are not taxed, workers may be discouraged from starting their own new businesses. In Japan, fringe benefits account for about 17% of labor costs. Thus, it is important to review the various economic and social arrangements pertaining to labor mobility, with the view to restoring neutrality in workers' decisions on continuing or leaving their present jobs.

4.2 Education

There is little doubt that the level of entrepreneurship in a society hinges on cultural factors regarding emphasis on individuals' independence and respect for entrepreneurs starting their own businesses. Entrepreneurial activities tend to be sluggish when educational systems do not embrace the needs of a competitive economy. (See Figure 4.)

Figure 4. Educational System and Entrepreneurship



Note: 1. "Entrepreneurship" and "Educational system" is measured (0-10) by the IMD survey (2000).
2. "Educational system" shows the degree to which the educational system meets the needs of a competitive economy.
3. *t*-statistics are in parentheses. R^2 is adjusted.
Source: IMD, *The World Competitiveness Yearbook*, 2000

Here, education plays a critical role in creating entrepreneurs for future business start-ups. Education fostering entrepreneurial spirit and ability can be implemented by strengthening the interaction between industry and schools/academia, promoting internships to expose students to real businesses, and expanding life-long learning programs. In the US, more than 500 entrepreneurial training courses have been established in universities and graduate schools, contributing to active creation of new businesses.

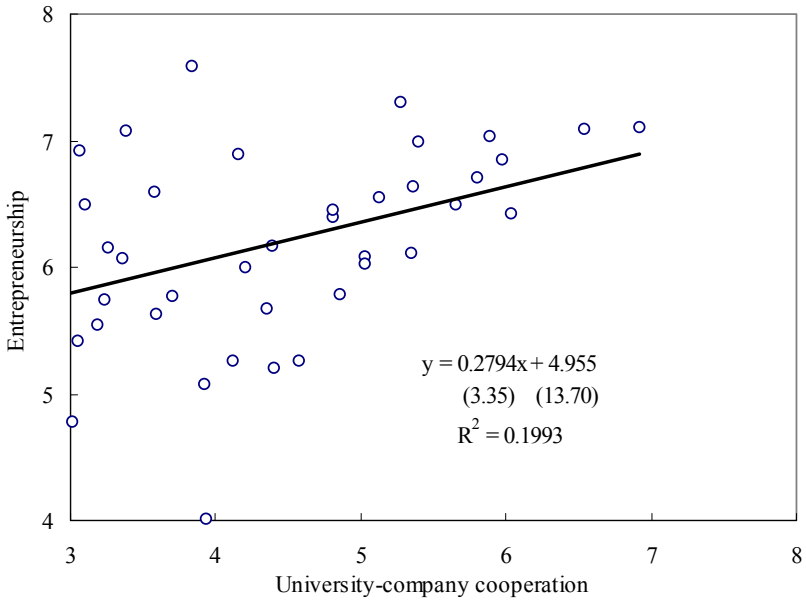
5. Expanding Access to Technologies and Information

Technological innovations are the seed for business start-ups. Innovative ideas can turn into successful ventures only when they are married with managerial skills and business know-how. Information regarding technological innovations, business opportunities, and business skills is key to linking up ingredients of new businesses. Thus, access to technologies and information is of great importance.

5.1 University-Company Cooperation

In enhancing access to technologies and information, cooperation between universities and companies is of particular importance (See Figure 5). The significance of university-company cooperation in fostering new businesses in high-tech areas is well underscored by Silicon Valley where Stanford University has been playing an eminent role. Such "hot spots" of entrepreneurial activities include Gladstone in Australia, the Valencia region in Spain, and the Hsinchu Science-based Industrial Park in Chinese Taipei. These cases point to the significance of the spatial concentration of business activities. Universities and research institutions can serve as the core of a clustering of venture businesses.

Figure 5. University-company Cooperation and Entrepreneurship



Note: 1. "Entrepreneurship" and "University-company cooperation" is measured (0-10) by the IMD survey (2000).
2. "University-company cooperation" shows the degree to which technology transfer between universities and companies is sufficient.
3. *t*-statistics are in parentheses. R^2 is adjusted.

Source: IMD, *The World Competitiveness Yearbook*, 2000

Some policy measures are useful in facilitating the matching of new technologies developed in universities and business expertise. In the US, "technology licensing organizations" (TLOs) were introduced in 1980 to facilitate the transfer of technologies from universities to the private/business sector. TLOs excavate new technologies that are developed in universities and have potential for commercialization, and confer licenses for the use of such technologies on private companies. Part of the revenue from licensing fees is reinvested in further research.

Japan has recently been keen to promote university-company cooperation and emulated the US model of TLOs, introducing new legislation in 1998. Ten TLOs have already been established and are expected to boost the transfer of technologies from universities to private/business sector. The government has also relaxed the restrictions on professors and research staff of national universities pursuing business interests in commercializing their own scientific findings.

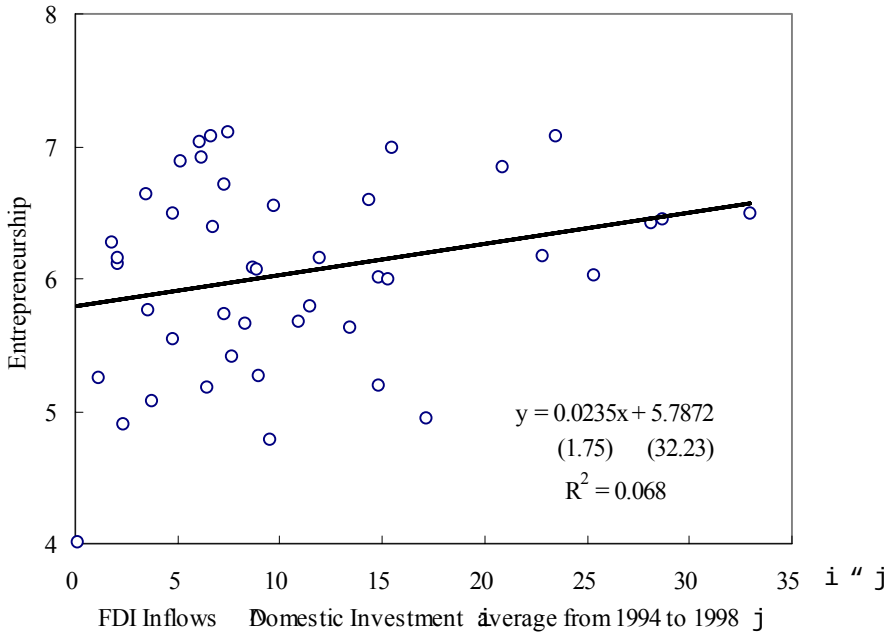
5.2 Foreign Direct Investment

For APEC developing economies, new technologies and innovations will become increasingly important as a source of economic growth. As economic development progresses, capital stock and labor contribute less and less to boosting economic growth as the law of diminishing returns sets in. In order to sustain growth and promote higher living standards, production efficiency needs to be improved by introducing new technologies.

Foreign direct investment (FDI) is an effective way to introduce new technologies that are not available domestically. Foreign direct investment stimulates competition, and

generates new business opportunities as foreign subsidiaries procure domestically some of the supplies they need. This opens the way for new businesses to expand. There is a positive, if not strong, relationship between FDI inflow and the degree of entrepreneurship across different economies. (See Figure 6).

Figure 6. Foreign Direct Investment and Entrepreneurship



Note: 1. "Entrepreneurship" is measured (0-10) by the IMD survey (2000).
2. "Domestic Investment" is gross fixed capital formation in respective economies.
3. *t*-statistics are in parentheses. R^2 is adjusted.

Source: IMD, *The World Competitiveness Yearbook*, 2000; IMF, *International Financial Statistics*, 2000

Thus, further investment liberalization is called for to introduce new technologies and stimulate entrepreneurship. Protection of intellectual property rights is of particular importance in enticing high-tech industries to developing economies where violation of intellectual property rights is rampant.

5.3 Business Incubation

The public and private/business sector provide business incubation services assisting entrepreneurs in starting and managing new businesses. They typically provide workspace equipped with utilities and some facilities for new companies on preferential and flexible terms. In addition, they often provide various advisory services including business management, finance and accounting services, access to business network, and legal services. Private companies providing business incubation services can recoup expenses and make profits by sharing in the future profits of successful new businesses.

Business incubation itself has become a new business opportunity, as the number of new businesses is rising particularly in the IT-related industries. However, many governments are also involved in business incubation in one way or another. The underlying idea is that markets under-supply business incubation services in view of the need for promoting new

businesses and employment, so that governments need to either undertake business incubation activities or assist them through subsidies and other means.

It is important to note that, however important promoting entrepreneurship is, the need for public intervention in incubation activities should be weighed carefully. Generally, the existence of an "externality" merits public intervention. Namely, public intervention can be justified, when business incubation generates greater returns to society than all the returns accrued to incubation operators and as a result the private sector supplies less incubation services than is socially desirable. In this regard, policy objectives such as balanced regional development may provide the case for government measures. While applying this general rule in the real world is a difficult task, governments need to carefully weigh the costs and benefits of public assistance to business incubation.

6. Developing Legal Infrastructure

Corporate law needs to be reviewed and revised as necessary, with a view to promoting entrepreneurship.

When bankruptcy laws exert too harsh penalties on failed business owners, they discourage people from starting their own businesses and make it difficult for bankrupt individuals to try again. Likewise, when bankruptcy laws do not allow failed companies under receivership to restructure and start all over again with relative ease, they have dampening effects on entrepreneurship. An appropriate balance needs to be found between the rights of creditors and the future prospects of failed companies/owners.

Since stock options are a useful means for new businesses to remunerate investors and managers, as cash flows and profits are very limited when new businesses start their operations. When new companies are successful and thus boost their market values, stock options may confer huge profits to their holders, giving strong incentives for investors, executives, and workers to help grow their companies. In light of the importance of stock options in fostering new businesses, corporate laws and taxation regarding stock options need to be revised as appropriate. Some provisions in corporate law may make the use of stock options unwieldy for new companies. When capital gains taxation is levied on stock options before the options are exercised, the attractiveness of stock options may be reduced.

As the new economy dictates speed and flexibility, many firms, new and old alike, have reorganized corporate structures into more decentralized ones, and have adopted performance-based compensation for managers and workers. Corporate laws and taxation should not inhibit flexible corporate restructuring. For example, until recently the prohibition against establishing holding companies was a stumbling block for corporate restructuring in Japan.

In efforts to promote entrepreneurship and facilitate flexible corporate restructuring, Japan has recently introduced a number of measures. In 1999, Parliament introduced new legislative measures to allow start-up companies to offer stock options to a wider group of stakeholders. Bankruptcy laws were also revised to streamline procedures to enable firms in distress to get back on their feet quickly, and a more comprehensive review of bankruptcy laws is now underway.

7. Summary

In wrapping up all the above discussions, it is useful to lay out a menu of public policies fostering entrepreneurship in a summary form. There is much scope for future research work to develop public policies for entrepreneurship, taking a closer look at the differing conditions APEC economies confront. The research of this project, drawing on experiences in Japan and a few other APEC economies provides a useful analytical basis to consider a menu of policies fostering entrepreneurship. The following areas are worth further study by APEC economies.

- Establish enabling economic conditions
  - Stable macroeconomic environment, deregulation, and trade/investment liberalization are of particular importance.

- Expand access to finance
  - Introduce "angel taxation" that does not levy high taxes on fluctuating investment incomes of individual investors in new businesses.
  - Allow loss carryover in corporate income taxes for a longer period for new businesses.
  - Develop stock markets for new businesses that have lower listing requirements but require stringent rules on disclosure and de-listing. Develop market makers to increase liquidity in secondary markets.
  - Review restrictions on equity investment by financial institutions without compromising prudence in their portfolios.
  - Utilize public financial institutions to supplement finance from private sources.

- Mobilize human resources for new businesses
  - Increase labor market flexibility by deregulation.
  - Revise as necessary the pension system and taxation with the view to restoring neutrality between continuing and changing jobs. Lack of portability of company pensions may discourage people from starting their own businesses. Taxation on different forms of workers' compensation may provide incentives to stay with secure jobs.
  - Promote internship for students, and life-long learning for workers of all age groups. Amend as necessary government regulations on educational/academic institutions in introducing internship and offering new programs for life-long education.

- Expand access to technologies and information.
  - Facilitate cooperation between universities and companies. "Technology transfer organizations" in the US may serve as a model. Deregulate as necessary regulations on activities of universities and researchers.
  - Support basic research that has spillover effects to applied research and innovations.
  - Strengthen intellectual property rights in developing economies.
  - Push further for investment liberalization in developing economies. FDI brings in new technologies as well as financial resources.
  - Examine the role of government in promoting business incubation.

- Develop legal infrastructure.
  - Revise as necessary bankruptcy laws with the view to promoting new businesses and swift reconstruction of failed companies. Too harsh penalties on failed company owners and protracted processes to reconstruct companies under receivership may discourage entrepreneurship.
  - Revise as necessary corporate laws and taxation regarding stock options. Stock options are a useful means for new businesses to remunerate investors, executives, and workers, and give strong incentives for them to help grow their companies.
  - Revise as necessary corporate law and taxation pertaining to corporate restructuring.

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Individual Report II (Korea)

The Long-term Trade Pattern of the APEC Economies

(Contents)

The Long-term Trade Pattern of the APEC Economies

1. Introduction

APEC (1995, 1997) states that one of the typical features of Asian economic development has been the association between higher economic growth and the deepening economic interdependence within the Asia-Pacific region. The interdependence among the economies of Asia-Pacific region has increased over the past decades and the regional dynamism has often been closely associated with the high regional concentration of trade and investment. The fact that the dynamism in the Asian Pacific region is based upon trade and investment is strongly supported by traditional international trade theories that try to explain the effects of international trade on prices, production, employment and consumption levels of the goods in each country. Economies can expand their production and improve their welfare by exporting goods in which they have comparative advantages.

Capital mobility, mainly in the form of direct investment, also leads to the optimal allocation of resources and, therefore, contributes greatly to economic growth. According to Krugman and Obsfeld (1996), there is a strong correlation between the expansion of trade and investment and rapid overall economic growth. In the 1990s, one of the central changes in world trade was the rapid export growth of the East Asian NIEs. The rapidly industrializing Asian economies were able to maintain high economic growth rates – almost 8-9 percent on average for the last 30 years – on the basis of export-oriented policy, thereby realizing the "East Asian miracle".

However, with the Asian financial crisis, most of the APEC member economies suffered serious economic downturns, and all APEC member economies experienced export contractions (even negative growth rates in some economies) during the crisis period of 1997-1998. There were nine APEC member economies showing negative export growth rates in the double-digit range: Australia, Chile, Japan, Malaysia, Papua New Guinea, Peru, Russia and Singapore (APEC 1999).

As trade, along with investment, has been the major engine backing the economic development of the Asia Pacific region, the APEC economies need to resume and maintain their growth dynamism through the further expansion of regional trade. In order to stimulate and accelerate intra-regional trade among the APEC economies, a significant degree of trade liberalization is required. At the same time, substantial economic reforms should be implemented so as to prevent another crisis and to achieve sustainable growth as the Asian Crisis has revealed the structural weaknesses of the most severely afflicted economies.

The aim of this paper is to forecast the long-term trade patterns of the APEC economies and to try to estimate the possible impact of trade liberalization and the economic reforms of the APEC economies on their expansion of trade. The results of the analysis will also provide policy implications.

2. Economic Model, Data, Parameters, and Assumptions

2.1 Description of Model

This paper forecasts the trade relations of the APEC economies in the long run and analyzes the impacts of trade liberalization and economic reforms on the trade patterns of the APEC

economies. Thus, an economic model that can track the trade linkages among the economies as well as industries within each economy is needed for the study. This paper employs a computational general equilibrium (CGE) model.[1]

Several factors make the general equilibrium framework most appropriate for analyzing the economic effects of major policy changes, such as trade liberalization. As the reduced trade barriers in the Asia-Pacific region generate more competition between the firms of member economies, this would likely induce producers to lower their prices. Thus, the general equilibrium models can portray the economic effects resulting from enhanced competition. The model will provide a more accurate estimation of these variables than the triangular calculations of partial equilibrium analysis. Furthermore, the general equilibrium approach allows factor prices to vary. The relative changes in the intermediate and primary input prices would presumably affect the ratios of a firm's material components and the amount of value-added to the primary production factors in each equilibrium. Partial equilibrium analyses assume constant factor prices during the experiments, thus limiting the accuracy of calculation as prices change with changes in the economic environment.

The CGE models have been used extensively to capture the essential features of economic activities. A CGE model is a simplified computer representation of one or more economies. Each model considers economic actions by consumers, producers, and the government. The CGE model provides a framework through which different and diverse policies can be examined. Once the basic model has been specified and actual data has been applied, various policies can be studied with minor modifications. The model used here is a static, Walrasian general equilibrium model that endogenously determines quantities and prices by using a descendant of the Johansen (1960) simulation approach.

a) Market Clearing Conditions

We begin with a description of market clearing conditions. First, the market-clearing conditions for labor and capital in each region are:

$$\bar{l}_r = \sum_j l_r^j \text{, and} \tag{1}$$

$$\bar{k}_r = \sum_j k_r^j \text{,} \tag{2}$$

where $\bar{l}_r$ ($\bar{k}_r$) represents the total supply of labor (capital) in region *r*. l_r^j (k_r^j) is the labor (capital) employed for production sector *j* in region *r*. Equations 1 and 2 imply that the entire supply of endowment factors should be employed in the production sector, in order to clear the endowment markets.

For each region in the model, the domestically-produced commodity, q_r^i, should be equal to the sum of the domestic use and region *r*'s sales of that commodity, so that

$$q_r^i = d_{cr}^i + \sum_j d_{zr}^{ji} + \sum_s x_{sr}^i \text{,} \tag{3}$$

[1] A detailed description of the CGE model is provided in Cheong (1995).

where x_{sr}^{i} is region *s*'s export of commodity *i* to region *r*. The first part of the right hand side of the equation represents the final private household consumption demand for that good, and the middle portion represents the intermediate inputs across all production sectors. The last part represents the total export amount of that commodity.

As shown in equation 4, imports of good *i* in region *r* will be disposed into final consumption and intermediate inputs.

$$m_r^i = m_{cr}^i + \sum_j m_{zr}^{ji}. \qquad (4)$$

The model will divide regional output into that for domestic use and that intended for export, maintaining equation 3 for clearing output market. The market for imports will be cleared via equation 4.

b) Consumer

If goods of the same category were truly homogeneous, each country would specialize in the production of a small number of goods, and cross-hauling of the same good would not be observed in real trade data. In order to portray more accurately the real world lack of homogeneity, many employ the Armington assumption to explain product differentiation. Armington (1969) suggested that products are differentiated by country of origin. Most perfectly-competitive CGE models use the Armington assumption, as do a number of other models that have been used in related literature.

The model accounts for multiple country activity, where each region has one representative consumer whose welfare level represents the welfare level of the region, and a Cobb-Douglas (C-D) formulation is specified for the top nest. Economic agents divide their composite commodity consumption into domestically-produced goods and imports at the middle nest after assessing welfare maximization. Then, the sources of imports are identified by the bottom nest of the utility function. The household's utility level will depend on the level of composite good consumption. At the second stage, the composite commodity will be divided into domestic good and composite import consumption. Mathematical C-D utility consumption function will be defined for all final composite commodities (imported or domestic) and regional saving, while assuming constant shares. The C-D utility function is indicated below:

$$u_r = \sum_i \delta_r^i * c_r^i, \text{ where } \sum_i \delta_r^i = 1. \qquad (5)$$

δ_r^i is the share of total expenditure on the composite commodity *i* of national income in region *r*. u_r is the percentage change in regional utility in region *r*, c_r^i is the percentage change in demand for the consumption of composite good *i* (which will be described later). In other words, regional utility will be determined by the weighted average of the consumption of composite commodities. With this specification of the utility index, any income change will be reflected in the regional utility, since the regional household will spend a portion of any income change on composite consumption goods and save the remainder.

Composite price index (p_r^{ci}) is calculated by averaging prices for imported final consumption goods and domestically produced goods, weighted with expenditure shares.

$$p_r^{ci} = \Theta_r^{ci} * p_{cr}^{mi} + \left(1 - \Theta_r^{ci}\right) * p_{cr}^{di} \tag{6}$$

In equation (6), Θ_r^{ci} represents consumer expenditure share on imported goods, while (1 - Θ_r^{ci}) represents domestically-produced goods. p_{cr}^{mi} (p_{cr}^{di}) stands for consumer's price for imported goods (domestically-produced goods).

Equations (7) and (8) define consumer's demand for domestically-produced goods (d_{cr}^{i}) and imported goods (m_{cr}^{i}) in functions of composite demand for consumption goods, prices, and price elasticity of substitution (σ_c^i).

$$d_{cr}^{i} = c_r^i + \sigma_c^i * \left\{ p_r^{ci} - p_{cr}^{di} \right\} \tag{7}$$

$$m_{cr}^{i} = c_r^i + \sigma_c^i * \left\{ p_r^{ci} - p_{cr}^{mi} \right\} \tag{8}$$

c) Production Sector

This paper uses a simple structure of production by assuming perfectly competitive technology. Therefore, the perfectly-competitive firms operate with constant-returns-to-scale technologies in their production process, where producer's prices are equal to the marginal costs of production. All firms use primary production factors and intermediate goods as their production inputs. Firms employ labor and capital as primary production factors. In addition to labor and capital, land is one of the primary production factors in the production of agricultural products. Both labor and capital are assumed to be perfectly mobile within the region, but immobile between regions.

The goods and services can be used as final consumption and intermediate goods. Primary production factors will be aggregated into value added, once again using a C.E.S. equation. In addition, the top of the production structure combines value added and the composite intermediate goods by using a fixed-coefficient (Leontief) technology. In other words, the percentage rates for output should be equal to those of value added and composite intermediate goods. VA_r^i is the demand for value added by the production sector *i* in region *r*, and z_r^{ji} is the conditional demand by the production sector *i* in region *r* for intermediate good *j*.

$$q_r^i = LEONTIEF\left(\overline{q}_r^j, z_r^{1i}, z_r^{2i}, z_r^{3i}, , ,\right) \tag{9}$$

As in equation 6 for consumers, firms calculate composite price index. Subscript *z* denotes intermediate production inputs, and superscript j implies production sector *j*.

$$p_r^{ji} = \Theta_r^{ji} * p_{zr}^{mji} + \left(1 - \Theta_r^{ji}\right) * p_{zr}^{dji} \qquad (10)$$

Demand for intermediate inputs of domestically-produced goods and imports will be functions of composite demand for consumption goods, prices, and price elasticity of substitution.

$$d_{zr}^{ji} = z_r^{ji} + \sigma_f^j * \left\{ p_r^{ji} - p_{zr}^{dji} \right\} \qquad (11)$$

$$m_{zr}^{ji} = z_r^{ji} + \sigma_f^j * \left\{ p_r^{ji} - p_{zr}^{mji} \right\} \qquad (12)$$

where p_r^{ji} is firm *j*'s price index for composite intermediate good *i* in region *r*. p_{zr}^{dji} (p_{zr}^{mji}) is the price which firm *j* in region *r* pays for domestically-produced (imported) intermediate good *i*. σ is the firm's elasticity of substitution between the domestically-produced intermediate and the imported intermediate. Note that the elasticity is assumed to be equal across all regions for the same intermediate input.

This paper uses a simple regional investment function, which is compatible to the static CGE model. Household decision determines the share of saving from regional income. In this model, regional saving will be realized by purchasing capital goods produced during a period, based on the expectation of the future rate of return to capital.[2] The model is simulated in a simple static setting because of technical difficulty in performing simulations with a dynamic CGE model with multi-sectors and multi-regions. The model can be simulated with two alternative specifications of the regional investment function: The first alternative is that the regional shares of global capital stock (which is the sum of regional capital stock) are assumed to remain constant during the simulation in order to simplify the regional capital formation and investment of each region. The other specification is to assume that regional investment will be adjusted, such that the regional rates of returns on capital are equal across all regions. The simulation results performed on the first specification of the regional investment function are reported.

d) Relationships between Price and Policy Variables

Most policy changes will be performed with the policy variables of imports and exports, and thus, it is necessary to specify how these policy variables are related to the price variables. The price of import, p_{rs}^{i}, is the sum of *c.i.f.* price, p_{rs}^{ci}, and import tariff, t_{rs}^{i}, and the price of export (*f.o.b.* price); p_{rs}^{fi}, is the domestic market price, p_r^{mi}, minus the export subsidy, s_{rs}^{i}, as defined below,

$$p_{rs}^{i} = p_{rs}^{ci} + t_{rs}^{i}, \text{ and} \qquad (13)$$

$$p_{rs}^{fi} = p_r^{mi} - s_{rs}^{i}, \qquad (14)$$

where the variables are percentage changes, and the subscript *rs* stands for from country *r* to

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[2] Because the model in this paper assumes static general equilibrium, this paper adopts this specification for saving. For full specification of saving, dynamic modeling will be required.

country *s*." s^{i}_{rs} represents the export tax, if it is negative. Data for regional imports and exports are available with the clarifications of sources and destinations, upon which equations 8 and 9 are based. But generally, it is not easy to collect import and export data for consumers and producers with the sources for each commodity. Thus, import prices with sources will be aggregated into composite import price index, $\overline{p}^{i}_{r}$.

$$\overline{p}^{i}_{r} = \sum_{s} \xi^{i}_{sr} * p^{i}_{sr}, \tag{15}$$

where ξ^{i}_{sr} is region *r*'s share of import *i* by source (from region *s*).

The import price in equation 13 will be channeled into the consumer price, p^{mi}_{cr}, (equation 8) and the producer price, p^{mji}_{zr}, (equation 12), through the next two equations,

$$p^{mi}_{cr} = \overline{p}^{i}_{r} + t^{mi}_{cr} \text{ and} \tag{16}$$

$$p^{mji}_{zr} = \overline{p}^{i}_{r} + t^{mji}_{zr}, \tag{17}$$

where t^{mi}_{cr} (t^{mji}_{zr}) is the tax on imported good *i* charged on consumer (producer) in region *r*. Import tariff cuts will reduce the import price in equation 8. A reduced import price will be reflected in the composite import price, via equation 13. In equations 16 and 17, consumers and producers will face lower import prices, and they will demand more imports, for which the channels are equations 8 and 12.

2.2. Parameters and Aggregation of Data

The CGE Model described in Section 1 requires vast amounts of data for the simulation. For example, information on supply and demand for primary production factors is needed for equations (1), (2), and (9). Equation (3) requires sectoral trade data with origin and destination. Collecting and benchmarking data for these equations is not easy. Thus, rather than building a database, this paper uses the GTAP database (base year is 1995) constructed by Hertel *et al* (1998). Table 1 shows the aggregation of regions and industry sectors of the GTAP database. The grouping of industry sectors is based on the similarities of production requirements in intermediate goods and primary production factors.

Table 1. Aggregation of Regions and Production Sectors

Region	Production Sector
(1) Indonesia	(1) Primary Industry
(2) Korea	(2) Resources (incl. Minerals.)
(3) Malaysia	(3) Textile
(4) Philippines	(4) Clothing (incl. Leather products)
(5) Thailand	(5) Chemicals (incl. Rubber and plastic)
(6) ANZ (Australia & New Zealand)	(6) Metal (incl. Ferrous and non-ferrous)
(7) CUS (Canada & USA)	(7) Metal Products
(8) Japan	(8) Transportation Equipment
(9) OAE (Other APEC Economies)	(9) Electric Equipment
(10) EU	(10) Machinery
(11) ROW	(11) Other Manufacturing
	(12) Services

As shown in Table 1, the data for world production, consumption, trade, etc. are aggregated into 11 regions, with each region divided into 12 production sectors. Production sectors consist of one primary sector (Primary industry), 10 manufacturing sectors and one service sector. The world economy is divided into 11 regions, and 9 of the 11 regions are APEC member economies. Papua New Guinea and Brunei Darussalam are not represented in this study, due to the lack of projection assumptions[3] and (or) relevant data. However, if information on these economies becomes available, these economies can be shown separately.

In addition to a database and a system of equations, a CGE model needs a set of parameters specifying the characteristics of economic agents, such as consumers and producers. This section presents two sets of data with regards to the elasticity of substitution, as given in Table 2. The first set of elasticities is a set of parameters based upon the Armington assumption with respect to domestically produced goods and imports, and the second is for imports from different sources.

Table 2. Elasticities of Substitution

	σ_d	σ_m
(1) Primary Industry	2.42	4.66
(2) Resources (incl. Minerals)	2.80	5.60
(3) Textile	2.20	4.40
(4) Clothing (incl. Leather products)	4.40	8.80
(5) Chemicals (incl. Rubber and plastic)	1.90	3.80
(6) Metal (incl. Ferrous and non-ferrous)	2.80	5.60
(7) Metal Products	2.80	5.60
(8) Transportation Equipment	2.80	10.40
(9) Electrical Equipment	5.20	5.60
(10) Machinery	2.80	5.60
(11) Other Manufacturing	2.80	4.95
(12) Services	2.40	3.81

Elasticities can be calculated using time series data of relevant variables. However, it is not easy to find data consistent with the CGE model. Thus, rather than trying to estimate those parameters, this paper takes into account the elasticities that Hertel (1998) calculated for CGE models using the aggregation facility of the GTAP. One thing to note is that these parameters are commonly applied to all economies in this study. If the information about these parameters for each economy is available and reliable, different parameters can be specified for different regions to reflect each economy's economic characteristics.

[3] Refer to section 3 of this chapter for projection assumptions.

The central column of Table 2 shows Armington elasticities. Parameters for the Armington assumption are 1.90-4.40 for most sectors, except the electric equipment sector, where the elasticity is assumed to be 5.20. Overall, the elasticities for imports by source are twice the elasticities for the Armington parameters. The CGE modeler performs sensitivity tests by studying the robustness of the model with respect to parameters.

2.3. Projection Assumptions[4]

This research, which is the part of the APEC Economic Committee project, *"APEC Economies beyond the Asian Crisis,"* is aimed at forecasting the long-term trade patterns of the APEC economies after the Asian Crisis. The growth projection measured by the Japanese research team is utilized for this purpose. The team outlines likely scenarios of economic growth in the next decade based on econometric work. Their work is based on the meta-production function approach and the convergence model approach[5]. Since the meta-production function approach estimates the quantitative effects of economic reforms in the Asian economies affected by financial crisis, this study employs the growth projections based on the approach. The meta-production function was first introduced by Hayami and Ruttan (1970) and employed by, among others, Lau and Yotopoulos (1989), and Boskin and Lau (1992). It explicitly estimates a production function, which is assumed only implicitly in the conditional convergence model approach.[6] The approach makes it possible to compare the level and the speed of efficiency improvement among the economies concerned.
The estimation equation is:

$$\ln Y_{it} = const. + \beta_1 \ln K_{it} + \beta_2 \ln L_{it} + \chi_i A_i + \psi_i T_i + \omega_j D_j ,$$

where Y_{it} denotes the real GDP, K_{it} the capital stock, L_{it} the employment in economy *i* at time *t*; and A_i and T_i denote constants and time trends, respectively, specific to the categories of economies *i*. The estimated coefficients of K_{it} and L_{it} correspond to the factor income shares of capital and labor, respectively. A_i s and T_i s are included to capture the initial efficiency level and the speed of efficiency improvement, specific to the categories of economies *i.* D_j s are dummies included in order to take into account various factors specific to certain economies and the effect of the banking crisis in Latin America.

On the basis of the estimated meta-production function, Japanese researchers projected the growth rate for the period 2000-2010 in two alternative scenarios; *the Main Projection* and *the Alternative Projection*. The main projection assumes that APEC economies would be successful in implementing structural measures that are required to address structural

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[4] This section heavily depends on Part I of the Individual Report I, "Growth Potential of APEC Economies Beyond the Asian Crisis", of this report.
[5] The conditional convergence model approach is based on the idea that there is a long-term tendency for per capita GDP of economies to *converge*; the lower the level of initial per capita GDP level is, the higher the growth rate of per capita GDP, and vice versa. The convergence is, however, *conditional*, in the sense that it can be observed only when the differences in such factors as the levels of human capital stock and physical capital investment are controlled for. For theoretical discussions of conditional convergence, see Barro and Sala-I-Martin (1995) and Romer (1996).
[6] This approach assumes that (i) all economies under consideration are subject to the same production function, and that (ii) each economy differs in the efficiency with which they utilize their inputs.

weaknesses and to foster entrepreneurship. The alternative projection was made under a scenario in which implementation of the structural measures in the crisis affected economies is assumed to be unsatisfactory. In both scenarios, the future values of labor input, L_{it}, are taken from the projections of the International Labor Organization. At the same time, future values of capital input, K_{it}, are consistent with those implied by the growth theory, and would be determined by such factors as the population growth rate, the speed of efficiency improvement, and the investment/GDP ratio. The difference between the two scenarios, therefore, lies in the speed of efficiency improvement and the investment/GDP ratio.

The main projection assumes that the investment/GDP ratios remain high at the average value attained during the period ranging from 1985 to 1997. In contrast, the alternative projection assumes the lack of efforts to implement reform measures. The speeds of efficiency improvement in Korea and ASEAN are predicted to fall to 1 percent and 0.5 percent, respectively. The investment/GDP ratios for both Korea and ASEAN are also assumed to fall to the average ratio attained during the period 1970-1985.

In the main projection, the real GDP growth can be maintained at a high level owing to the rapid improvement of efficiency and the high investment level. ASEAN member economies are expected to achieve an even higher growth rate than they did during the period 1990 to 1997. If the reform is implemented unsatisfactorily, as is the case in the alternative projection, the growth rate drops significantly because of the slowdown of the efficiency improvement and the low level of investment.

The real GDP growth rates in the main projection are much higher than those in the alternative projection. Under the main projection, the crisis-hit Asian economies are expected to experience growth rate higher than the alternative projection by 2.3 percent. On the other hand, the growth rates of real GDP in the developed economies, such as Japan, the U.S.A and Canada, will remain stable.

Then, what difference will the economic reform measures make in the crisis-hit Asian economies such as Korea, Indonesia, Malaysia, the Philippines and Thailand? Those five economies have been suffering from economic difficulties since the Asian economic crisis in 1997. According to APEC (2000), it is projected that crisis-hit economies will record higher growth rates of capital and productivity under the main projection. For instance, Korea's capital growth rates will increase and productivity will also rise. In addition, its real GDP is expected to grow higher. Similar patterns can be found in the other three economies. Indonesia, Malaysia, and Thailand will achieve significant growth in capital with their reform policies. In addition, the real GDP will grow up more by about 3 percent under the main projection than under the alternative projection. To sum up, economic reforms will accelerate the economic growth of these five Asian economies.

3. Projection of APEC's Trade Structure in 2010

The Asia-Pacific region has been the most dynamic part of the global economy over the last two decades with the intensification of economic ties within the region (Garnaut and Drysdale 1995). According to the 1999 APEC Economic Outlook[7], the trade volume within APEC is so enormous that APEC economies are their own main trading partners. In fact, 70 to 80 percent

[7] See Section 2.2 of the *1999 APEC Economic Outlook* for export market destinations of APEC member economies.

of APEC members' exports are heading to other APEC economies. In order to maintain this level of dynamism within the region, it is essential to keep expanding trade through trade liberalization and the improvement of other institutional measures.

In this Chapter, the trade structure of the APEC economies is projected for the year 2010 by utilizing the CGE model and assumptions discussed in Chapter II. Then, we analyze the impacts of APEC trade liberalization and economic reforms in the Asian economies hit by the economic crisis.

3.1. Baseline Forecasting of the APEC Economies in 2010

This section discusses the production and trade structures of the APEC economies in 2010 under the assumption that the Asian crisis affected economies will not undertake any economic reform measures and that the current trade barriers will not be eliminated within APEC. Table 3 shows estimates of global changes in output, world price and trade volume by sector in 2010.[8] Sectoral production levels are to increase by 34 to 52 percent during the period ranging from 1996 to 2010. Even the primary sector, including agriculture, fisheries, and forestry, is forecast to increase production by 34 percent. The highest production increase is forecast in ferrous and non-ferrous metals, among 10 manufacturing sectors, followed by machinery. Production growth rates in other sectors are estimated to be in the 40s in percent range.

Table 3. Sectoral Production and Trade Volume in 2010

	Production(%)	World Price(%)	Exports (%)
Primary Industry	33.65	2.99	31.47
Resources	48.41	104.19	46.83
Textiles	46.68	0.29	44.19
Clothing	41.51	-1.05	48.60
Chemical Plastic	43.10	16.37	47.28
Metal	51.30	9.27	51.71
Metal Products	43.74	4.02	50.00
Transportation Equipment	45.54	2.90	48.15
Electrical Equipment	44.45	-0.41	53.49
Machinery	49.22	1.68	53.57
Other Manufacturing	44.45	2.79	46.23
Services	41.60	0.26	46.47

However, world prices in different sectors will fluctuate considerably. World prices in the clothing and electric equipment industries will drop slightly while the prices in the other 10 sectors will increase to varying degrees. The sharpest increase, of 104 percent, is estimated for the resources sector. The chemical and metal industries, whose prices will rise over 9 percent, come next. Prices in other sectors will change by less than 5 percent between 1996 and 2010. The price increases in the chemical and metal industries are likely to be related to the substantial price increases of the resources industry considering that resources make up a significant portion of total inputs for the two industries.

Changes in world trade volumes by sector are provided in the fourth column in Table 3.

[8] Since the base year of the GTAP database is 1995, the estimates in this chapter should be interpreted to be percentage changes from 1995.

Sectoral trade patterns seem to be quite stable, compared with the sectoral pattern for prices. Electrical equipment and machinery are expected to grow the most, by 54 percent. In the metal and metal product sectors, global export volumes will jump by more than 50 percent whereas the export growth in the agricultural sector is projected to be lowest.

Thus far, we have analyzed sectoral production and trade changes from the global perspective. Now, the specific production and trade patterns for each of the APEC economies will be brought into sharp focus. Table 4 summarizes sectoral production variations by region by dividing the change in global production into sectoral production changes by region. Since growth rates of capital, labor and productivity of Asian developing economies, are higher than those of other regions, general production growth rates are substantially high in those economies. Some of the Asian developing economies will double their production levels in the transportation equipment, metal, and metal products sectors. On the other hand, developed economies, such as Japan, Canada, and the USA, will only modestly increase their production. Australia and New Zealand are expected to undergo production decreases in the metal industries

Table 4. Sectoral Production by Region

(unit: %)

	Indonesia	Korea	Malaysia	Philippines	Thailand
Primary Industry	31.50	31.07	37.38	39.87	11.39
Resources	41.88	71.39	32.48	54.26	36.89
Textiles	20.04	43.86	72.86	58.83	33.03
Clothing	13.11	31.41	86.13	72.77	27.68
Chemical Plastic	28.07	52.65	36.74	21.95	45.51
Metal	44.55	92.69	8.36	14.22	105.80
Metal Products	46.13	74.82	90.68	43.71	54.21
Transportation Equipment	57.62	102.11	128.48	67.49	63.50
Electrical Equipment	48.87	75.33	88.92	41.57	76.52
Machinery	51.48	83.75	93.12	51.45	81.93
Other Manufacturing	36.80	60.96	73.04	47.12	45.48
Services	49.91	66.03	66.63	54.26	40.37

	ANZ	CUS	Japan	OAE	EU	ROW
Primary Industry	16.73	24.78	14.79	53.73	22.65	54.80
Resources	37.05	33.12	59.93	54.26	33.20	57.47
Textiles	13.46	21.15	21.68	78.83	20.97	78.90
Clothing	3.41	12.92	15.21	82.34	6.20	91.62
Chemical Plastic	14.24	22.85	37.43	75.20	35.12	69.12
Metal	-11.15	27.02	45.06	87.99	28.44	85.22
Metal Products	23.09	29.58	33.20	85.92	35.45	84.84
Transportation Equipment	11.84	28.35	50.24	150.71	26.60	102.92
Electrical Equipment	18.29	30.23	34.82	90.81	28.92	90.45
Machinery	16.82	33.69	44.67	98.75	31.85	87.11
Other Manufacturing	24.03	31.11	30.23	83.18	31.61	88.17
Services	34.61	32.63	28.97	84.02	32.43	86.39

According to Table 4, there will be a rapid transformation in the industrial structures of the Asian developing economies. In Korea's case, capital intensive industries, such as metals, metal products, transportation equipment, electrical goods, and machinery are expected to grow rapidly. In contrast, agricultural production and production in other labor intensive industries such as clothing will slow down, thereby decreasing their shares of total national output (Figures 1, 2 and 3-1, 3-2). In Figures 3-1 and 3-2, the shares of industries in 1995 and 2010 are provided. The share of the heavy and chemical industries is projected to jump from 29.6 % to 37 % while the share of the primary and resources sectors will be halved during the period. The service sector continues to take the biggest share. Similar trends can be found in Indonesia, Thailand, and Malaysia admitting the particularity of each economy.

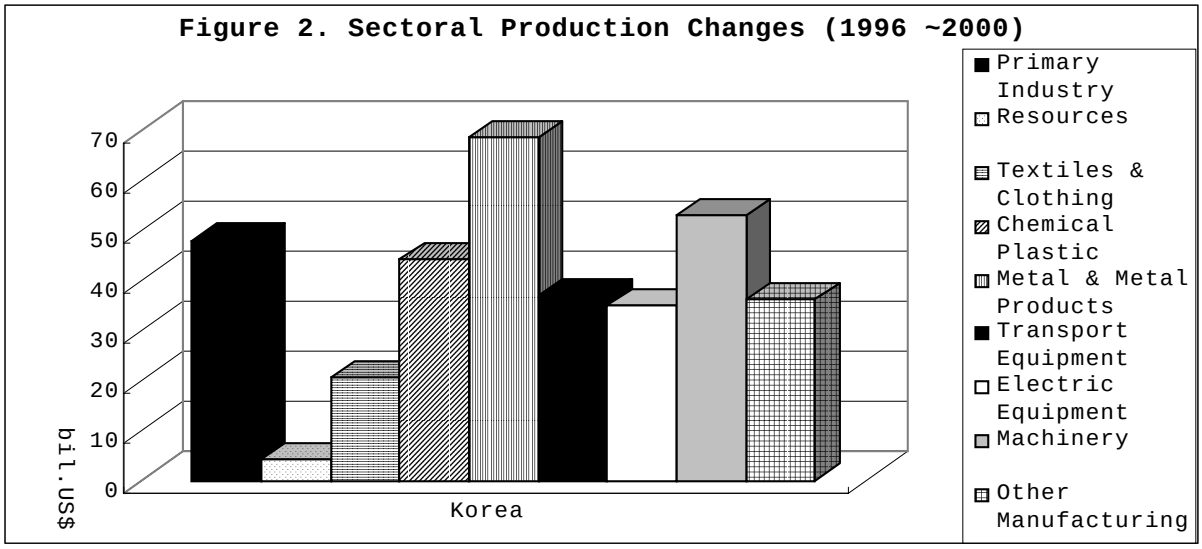


Figure 2. Sectoral Production Changes (1996 ~2000)
70
60
50
40
30
20
10
0
bil.US$
Korea
Primary Industry Resources
Textiles & Clothing
Chemical Plastic
Metal & Metal Products
Transport Equipment
Electric Equipment
Machinery
Other Manufacturing

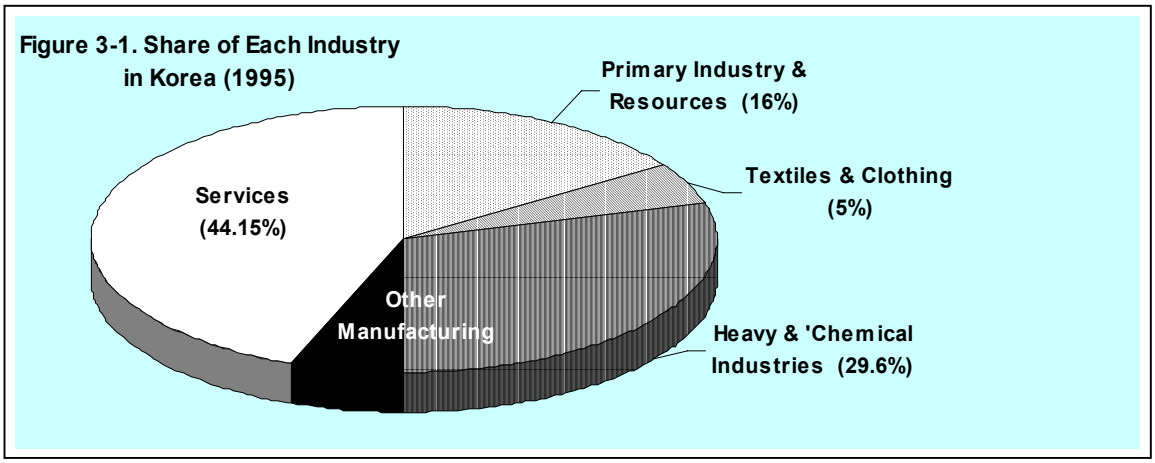


Figure 3-1. Share of Each Industry in Korea (1995)
Primary Industry & Resources (16%)
Textiles & Clothing (5%)
Heavy & 'Chemical Industries (29.6%)
Other Manufacturing
Services (44.15%)

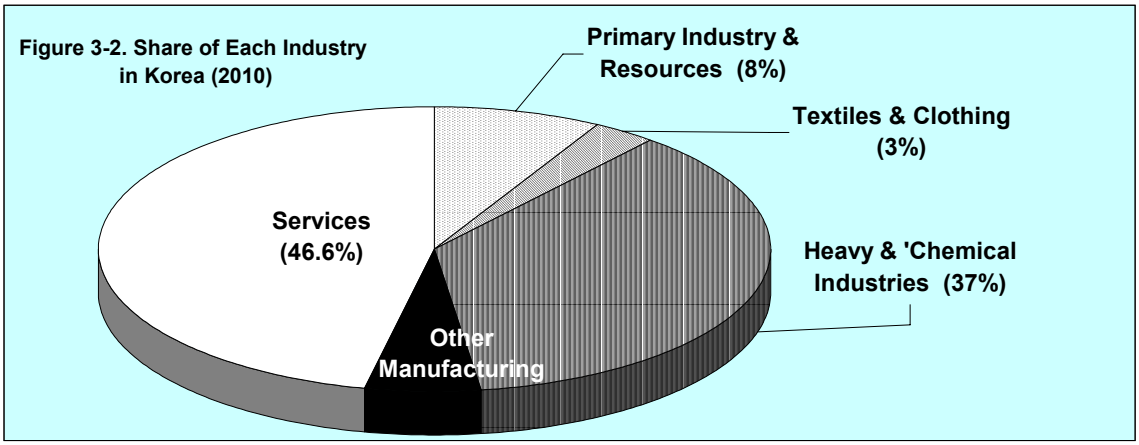


Figure 3-2. Share of Each Industry in Korea (2010)
Primary Industry & Resources (8%)
Textiles & Clothing (3%)
Heavy & 'Chemical Industries (37%)
Other Manufacturing
Services (46.6%)

Sectoral trade patterns by region are summed up in Tables 5 and 6. Although most economies will experience export increases, there is a wide variation in their growth rates. As for sectoral production changes, the growth rates for exports will be smooth across sectors in some advanced economies while fluctuating, relatively, in developing economies. For the USA and Canada, a 15 to 38 percent rate of export growth is expected for most sectors except for resources and the clothing sector. The North American economies show sectoral export growth pattern similar to many other APEC economies. Nevertheless, industries in Australia and New Zealand are expected to follow different patterns from the other APEC economies. For example, Australia and New Zealand are deemed to face export decreases in most sectors. It is not easy to identify the background reasons for this as only the growth rates of primary factors and productivity are shocked and the sizes of these shocks for these economies are similar to those used for the other advanced economies.

Unlike the advanced economies, the developing economies are expected to increase their exports substantially. High export growth rates, especially for the transportation sectors, can be observed in many developing economies. Several developing APEC economies including Indonesia and Malaysia, are expected to have their highest export growth rates in their transportation equipment industries. This industry will be the second highest export growth sector in Korea, the Philippines and Thailand.

Table 5. Sectoral Exports by Region

(unit: %)

	Indonesia	Korea	Malaysia	Philippine	Thailand
Primary Industry	-15.18	-4.94	19.05	40.68	-5.28
Resources	46.43	155.69	22.92	89.34	36.98
Textiles	26.30	45.30	67.10	58.92	44.04
Clothing	2.94	17.25	92.66	82.76	21.86
Chemical Plastic	7.40	48.60	19.74	-25.04	75.11
Metal	46.47	113.00	-20.84	-11.30	154.64
Metal Products	45.59	89.31	115.01	40.16	71.12
Transportation Equipment	81.72	138.77	179.34	88.41	125.82
Electrical Equipment	46.80	76.38	89.09	41.82	84.27
Machinery	53.27	82.58	93.62	51.90	93.11
Other Manufacturing	29.87	47.75	73.07	46.10	52.94
Services	27.00	64.95	65.27	91.26	29.73

	ANZ	CUS	Japan	OAE	EU	ROW
Primary Industry	6.93	38.25	67.65	37.70	24.63	50.52
Resources	56.90	78.92	315.62	-7.16	51.96	44.91
Textiles	6.51	15.66	41.61	77.90	22.22	73.85
Clothing	-30.15	-1.98	11.33	83.09	-6.38	94.20
Chemical Plastic	3.51	25.85	120.90	63.18	48.27	34.91
Metal	-31.88	22.76	116.27	69.68	30.02	76.79
Metal Products	-8.85	29.22	65.48	84.41	35.75	73.10
Transportation Equipment	-22.62	20.43	90.42	211.86	21.27	123.39
Electrical Equipment	10.80	26.81	59.01	89.22	25.14	85.20
Machinery	3.63	36.83	70.13	101.34	32.03	78.15
Other Manufacturing	0.15	32.27	55.44	77.19	33.48	78.98
Service	12.05	29.30	50.73	94.01	32.60	71.10

Table 6. Sectoral Imports by Region

(unit: %)

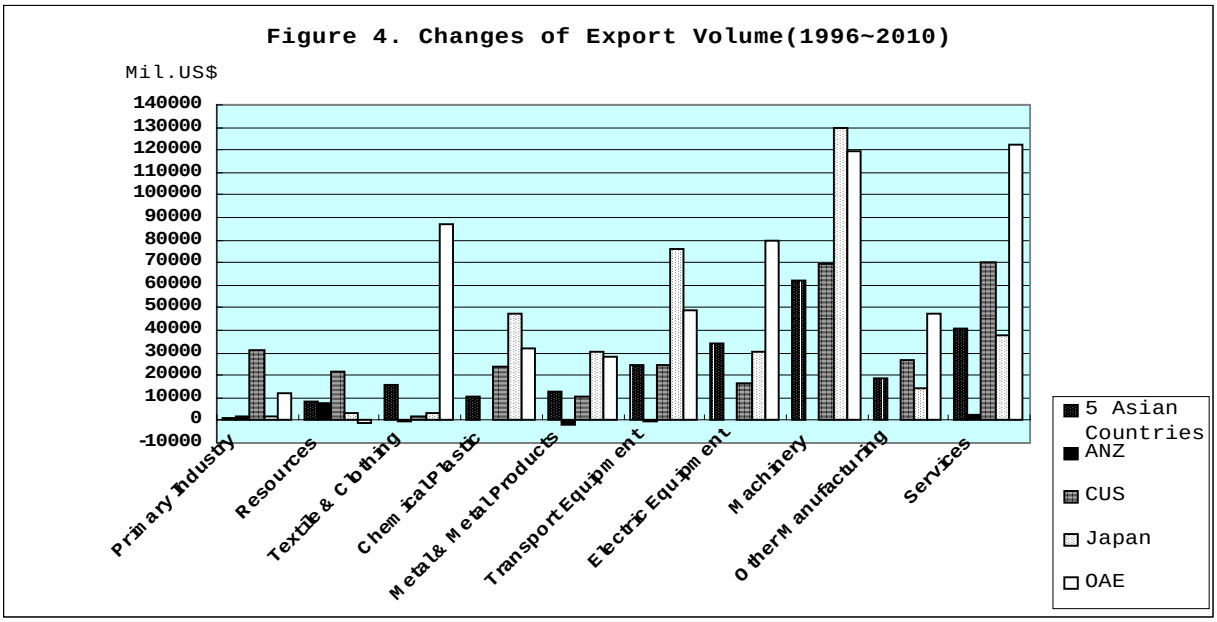
	Indonesia	Korea	Malaysia	Philippines	Thailand
Primary Industry	66.29	48.36	50.78	33.71	44.70
Resources	50.67	55.38	69.15	29.09	17.31
Textiles	20.72	47.69	68.87	62.19	32.67
Clothing	43.23	46.22	63.12	45.30	44.07
Chemical Plastic	53.27	66.21	74.69	58.89	34.55
Metal	51.71	68.25	93.57	49.68	49.85
Metal Products	55.61	60.32	54.03	53.15	48.23
Transportation Equipment	53.16	50.85	50.37	47.87	44.76
Electrical Equipment	52.26	64.62	74.34	43.79	58.53
Machinery	52.47	70.92	71.45	45.86	57.83
Other Manufacturing	54.90	62.24	64.94	47.55	46.46
Services	64.80	49.41	56.97	25.56	44.82

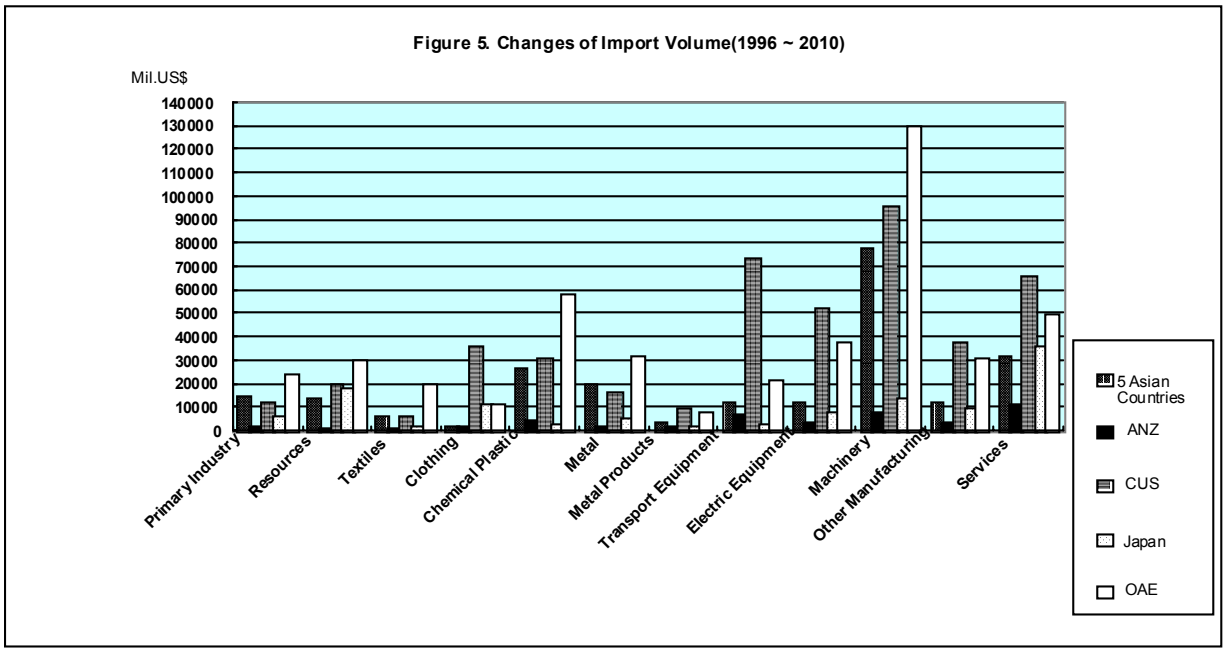
	ANZ	CUS	Japan	OAE	EU	ROW
Primary Industry	34.47	21.95	9.27	53.39	24.57	49.05
Resources	27.02	28.31	29.39	130.13	34.53	85.56
Textiles	31.55	36.21	26.31	64.13	26.33	61.77
Clothing	68.48	55.95	40.73	58.55	41.93	54.54
Chemical Plastic	38.73	34.29	8.19	76.77	29.42	85.31
Metal	51.47	41.76	27.06	91.74	35.19	76.23
Metal Products	59.75	42.86	30.11	69.29	39.83	72.87
Transportation Equipment	64.25	49.95	15.50	57.06	37.55	71.12
Electrical Equipment	48.54	52.11	33.24	77.99	42.60	70.65
Machinery	48.89	44.09	30.15	75.18	39.27	73.16
Other Manufacturing	47.42	38.37	27.14	69.87	35.93	73.94
Services	52.44	41.66	32.75	61.91	37.97	70.25

Import growth patterns are even less varied than those for exports. Even the imports of the developing regions will grow moderately across sectors. For example, Korea's overall imports will grow by 46 to 71 percent for the period 1996 to 2010. As was the case for exports, however, the developing economies will generally have higher import growth rates than the developed economies. Indonesia is expected to increase its imports by 50 to over 60 percent for most sectors while Japan's sectoral imports will grow by 8 to 41 percent.

While Tables 5 and 6 show the expected growth rates of sectoral exports and imports for the period 1996 to 2010, it is not easy to establish to what extent trade volumes will be increased by. In order to study the changes in the trade structure more accurately, Figures 4 and 5 are provided with trade volumes equivalent to the percentage changes of exports and imports. Out of 11 production sectors, machinery is expected to be the most actively traded product. According to Figure 4, Japan will be a leading export country, increasing its exports by 130 billion dollars, followed by all other APEC economies with export growth of 120 billion dollars. Japan also will record the highest export growth for chemicals and transportation equipment. In services, textiles and clothing, and electrical equipment, other the APEC economies (OAE) will show the greatest increases.

Import volume changes are illustrated in detail for each region in Figure 5. The five Asian economies will greatly increase their imports, especially in the chemical and other heavy industries. Import volumes will rise markedly in the other APEC economies, as was the case for their export volumes. Japan, however, shows only a slight rise in imports when compared with its increase in export volumes. This means the economy will enjoy a considerable trade surplus. Considering the destination of the increased exports by sector, the OAE, who were expected to increase their exports of machinery by 120 billion dollars, will absorb approximately 40 percent of the global growth of the trade in machinery. The region's imports of metals and chemicals will increase by the most. Most of the increase in the export of clothing, transportation equipment, and electrical equipment will be destined for the USA and Canada.





3.2. Impact of APEC Trade Liberalization on Trade Patterns

In Section 1, regional production and trade are projected for 2010 using a CGE model and projection assumptions. However, this projection does not reflect the impact of the trade liberalization measures, which will be undertaken by the APEC economies. Since APEC's inception, trade liberalization has been one of its main pillars, along with ECOTECH, since its inception. The APEC Leaders declared the 2010/2020 trade liberalization goal in Bogor in November 1994. In this section, the impact of trade liberalization under the *Bogor Declaration* is estimated. In order to do so, two additional assumptions had to be taken into account based on the following questions: First, in what way will APEC liberalize trade? Second, will APEC extend the benefits of trade liberalization to non-members?

In the first place, this paper preconditions a simple scheme for trade liberalization following the basic direction of the *Bogor Declaration*. That is, the advanced economies of Australia, Canada, Japan, New Zealand and the USA will liberalize trade completely while the developing APEC economies will reduce half of their existing tariffs (base year is 1995).[9] For the second question, only unilateral trade liberalization will be taken into account when measuring the impact. Non-discrimination is one of APEC's general principles adopted at the APEC leaders' meeting in Osaka, Japan (November 19, 1995), and the underlying principle is the long-term goal of free and open trade and investment in the region. In short, this paper assumes that the APEC economies will liberalize trade unilaterally based on the principle of non-discrimination.

When the trade liberalization measures are taken unilaterally, most economies generally have their utility level improved, although there is a great degree of variation across the economies. The Philippines will benefit most from liberalization with their utility level increasing more than 20 percent. The utility levels for Korea and Malaysia will rise moderately at 7 and 6 percent, respectively. The advanced regions, by contrast, will see minor increases of 0 to 2 percent. Interestingly enough, Indonesia and Thailand lag behind the other Asian developing economies with their utility improvement rates predicted to be less than 2 percent.

The equivalent variation fluctuates considerably across the APEC economies. Japan will have the highest value at over 88 billion dollars per year whereas those for the North American and ANZ economies will be less than one fifth of Japan's. In the case of newly industrialized economies, such as Hong Kong, China; Korea; and Chinese Taipei, the values for equivalent variations will increase moderately at between 20 to 40 billion dollars.

The impact of trade liberalization on the real GDP level will be generally positive, varying greatly among developing and advanced economies. The developing economies will experience considerable increases, while the advanced economies will show only slight improvement. The Philippines and Thailand are to experience the highest growth at more than 2.0 percent on average per year. They will be followed by Malaysia with annual increases of 1.3 percent. The other APEC economies will show moderate improvements in real GDP at around 0.57 percent.

In terms of trade volumes, trade liberalization will lead to positive growth in exports as well as in imports. However, its effect on imports will be greater than on exports. This is because the non-APEC regions of the EU and the ROW will increase exports to APEC whereas the APEC

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[9] 50 percent tariff cuts are assumed, since the paper projects the economy for 2010. If deliberate tariff reduction schedule is available, it can be used for more accurate estimates.

economies will have limited market access to non-member economies. In the case of exports, most of the developing economies will witness marked growth. For example, the Philippines and Thailand will increase their exports by more than 10 percent per year. Most of the advanced economies will have growth rates of less than 6 percent. Japan will be the only advanced economy to experience high export growth. The growth pattern for imports is similar to that of exports, except that some of the non-APEC economies will observe negative growth.

Table 7. Impact of Trade Liberalization by APEC
(Percentage Deviations from Baseline)

(unit: %, US$million)

	Utility	Equivalent Variation.	QGDP	Qxwreg	Qiwreg
Indonesia	1.74	4433	0.33	5.10	6.43
Korea	7.02	37472	0.49	4.37	6.95
Malaysia	5.83	7200	1.32	3.29	4.64
Philippines	23.55	18148	2.44	12.65	16.28
Thailand	0.61	1149	2.62	10.39	12.08
ANZ	3.59	16690	0.18	4.34	12.64
CUS	0.17	14496	0.02	5.81	4.69
Japan	1.77	88223	0.44	10.77	15.32
OAE	4.69	91851	0.57	6.03	8.21
EU	0.2	17751	0	0.92	0.09
ROW	0.21	12448	0.01	1.07	-0.15

Tables 8 and 9 show the percentage deviation of trade volume from baseline by economy and by sector. Most of the economies are expected to enlarge their export volumes as well as import volumes after APEC's trade liberalization. Certain patterns can be extrapolated from the simulation results.

Developed economies, such as the USA, Canada and Australia, show the highest positive deviation of primary industry exports. In the case of the USA and Canada, the export deviation from the baseline in the primary industry is 75 percent while those in most other sectors remain negative. Australia and New Zealand also show negative deviation in most sectors except for the primary and resources industries. The reason for the reduction in manufacturing exports in North America and Oceania can be attributed to the reduction of the high tariffs on agricultural products. That is, resources in these economies will shift to the agricultural sector from manufacturing sectors, in order take advantage of easier market access for agricultural goods in East Asian economies with high tariffs on agricultural products. Japan is likely to see its greatest increase in exports in the primary and light industries along with other advanced economies. Unlike them, however, Japan's exports increase markedly in all the sectors examined (primary industry, 49 percent and textiles and clothing, 38 and 53 percent, respectively) although trade growth in terms of volume will not be significant except for textiles.

The estimates show that the deviations for the developing economies are generally higher with regard to export volumes than those for the developed economies. Among the developing economies, the Philippines and Indonesia show high rates of exports increase across most sectors while Malaysia, Thailand and Korea present modest fluctuations. As for the primary industries, the developed economies contrast with the developing economies with negative

figures standing at between 0 and -30 percent. From the table, the sector displaying the highest deviation is the clothing sector in almost every region, particularly in Malaysia, the Philippines and Indonesia. In the meantime, Thailand presents the greatest deviation in transportation equipment at 112 percent. The Philippines recorded a high deviation of 56 percent in this sector as well.

According to table 9, import deviation is less off-centered than export deviation for most economies. The level of fluctuation is generally less than 10 percent except for some primary and light industries. The clothing sector shows the highest deviation, ranging from 25 to 33 percent in most developed economies. A large deviation can also be observed in Japan's primary sectors at 99.81 percent. Australia and New Zealand show quite high deviations in transport equipment and metal products at 27 and 33 percent, respectively.

As was the case for the developed economies, serious deviations can be noticed in the primary and light industries in most developing economies. In these economies, especially in Korea and Malaysia, the deviation remains relatively stable except for those two industries. Korea is predicted to have the highest deviation in textiles, registering import growth rates of 20 percent. In Thailand, the Philippines and Malaysia, the deviation is greatest in the clothing sector at 95, 51, and 27 percent, respectively.

To sum up, trade liberalization in APEC will generally increase exports as well as imports in almost every economy. By economy, the developing economies are more likely to be impacted by APEC trade liberalization than the developed economies. By sector, a wide range of variation was measured in the primary and clothing sectors in almost all the economies.

Table 8. Percentage Deviation of Exports from Baseline

(unit: %)

	Indonesia	Korea	Malaysia	Philippine	Thailand
Primary Industry	-9.39	-29.67	7.27	-3.1	-0.19
Resources	0.11	7.52	-0.22	4.14	5.35
Textiles	14.98	22.32	6.68	21.64	26.59
Clothing	37.77	38.26	47.33	65.07	28.43
Chemical Plastic	7.14	11.3	10.32	11.66	8.77
Metal	2.74	6.38	0.74	11.13	4.11
Metal Products	3.52	6.11	-1.58	28.18	11.4
Transportation Equipment	11.88	1.81	3.92	55.83	112.31
Electrical Equipment	2.88	-2.31	-0.44	31.76	1.95
Machinery	20.15	-0.3	2.26	29.11	19.52
Other Manufacturing	3.78	9.56	2.63	1.82	5.16
Services	2.35	-3.21	1.24	-10.76	3.8

	ANZ	CUS	Japan	OAE	EU	ROW
Primary Industry	30.13	74.8	48.55	-9.46	3	0.75
Resources	1.36	1.92	0.66	3.25	-0.01	0.14
Textiles	-15.35	-9.59	38.11	19.52	0.04	-0.34
Clothing	-2.15	2.51	52.67	19.57	1.14	6.95
Chemical Plastic	-4.3	-0.52	7.08	10.71	0.43	0.56
Metal	-8.37	-1.43	11.58	2.63	1.05	0.5
Metal Products	-8.26	-2.55	13.14	12.11	0.98	2.04
Transportation Equipment	-9.89	-6.7	23.79	4.36	2.01	-1.25
Electrical Equipment	-6.48	-0.56	7.36	4	-1.08	-0.91
Machinery	-7.74	-0.94	6.38	5.02	0.22	0.14
Other Manufacturing	-13.79	-1.5	13.81	8.19	0.9	0.66
Services	-4.83	2.92	4.35	-1.18	1.14	2.41

Table 9. Percentage Deviation of Imports from Baseline

(unit: %)

	Indonesia	Korea	Malaysia	Philippines	Thailand
Primary Industry	18.34	19.53	24.9	42.58	33.02
Resources	2.28	1.86	7.41	2.22	2.05
Textiles	28.84	19.68	13.3	39.08	17.14
Clothing	17.09	17.28	26.75	50.94	94.96
Chemical Plastic	5.51	6.67	2.37	6	10.67
Metal	2.66	5.63	0.81	17.08	1.51
Metal Products	18.22	11.35	10.52	10.84	23.29
Transportation Equipment	8.71	14.52	16.19	12.09	34.82
Electrical Equipment	10.45	11.79	2.9	21.6	11.35
Machinery	2.44	5.28	1.75	17.54	12.72
Other Manufacturing	12.66	8.86	7.8	20.72	22.64
Services	-0.53	3.87	-0.12	9.24	-2.27

	ANZ	CUS	Japan	OAE	EU	ROW
Primary Industry	20.24	20.53	99.81	14.06	0.33	-0.3
Resources	-4.36	-0.84	1.67	2.05	0.17	0.19
Textiles	17.5	7.72	3.68	25.61	0.27	1.08
Clothing	32.75	29.89	25.23	20.05	1.24	2.64
Chemical Plastic	7.87	4.01	3.2	6.24	0.2	0.11
Metal	5.62	1.86	3.64	7	0.15	-0.24
Metal Products	31.64	5.18	2.42	14.3	-0.23	-0.65
Transportation Equipment	26.67	4.8	9.78	22.91	0.15	-0.26
Electrical Equipment	8.04	1.92	3.97	5	-0.34	-0.48
Machinery	12.51	2.93	1.81	5.2	-0.27	-0.69
Other Manufacturing	17.86	3.02	0.28	10.51	0.15	-0.16
Services	5.07	-1.01	3.46	2.2	-0.04	-0.49

The impact of APEC trade liberalization on trade patterns is set forth in Table 10. The projection reveals that most of the economies will generally benefit from APEC trade liberalization via the expansion of trade volumes. The USA and Canada will export 91 percent of its total increase in exports to other APEC economies, which will amount to 60.5 billion dollars. Japanese exports to APEC member economies will make up 94 percent of its total increase in exports, reaching 74.9 billion dollars. On the other hand, the economy's exports to non-APEC region will be limited to 4.8 billion dollars. The other economies will follow similar trade patterns. Thailand and Indonesia will export 61.29 and 62.6 percent of their total increase in exports to other APEC economies, respectively. In the case of Korea, the Philippines, Australia and New Zealand, their trade with APEC member economies after trade liberalization will increase remarkably but the trade with non-members will decrease. The projection indicates that Korean trade with non-members will decrease by 2.3 billion dollars while growing by up to 11.13 billion dollars with APEC members. Similarly, Australia and New Zealand will experience a rise of 5.3 billion dollars in exports to members, but will see a decline of 1.5 billion dollars in trade to non-members.

It can be summed up that trade liberalization will stimulate trade among the member economies. Even in the event of non-discriminatory – unilateral – trade liberalization, APEC trade will soar. Intra-regional trade will make up a substantial portion of the total trade increase, standing at 92.37 percent and amounting to 224.6 billion dollars. Trade with non–members, by contrast, will comprise only 7.63 percent of the total trade growth. Therefore, it can be concluded that APEC trade liberalization will strengthen economic ties among the member economies by vastly expanding trade opportunities.

Table 10. Impact of APEC Trade Liberalization on Trade Patterns

(Unit: Million Dollars)

	APEC	Non-APEC	Total
Indonesia	2382	1425	3807
Korea	11127	-2279	8848
Malaysia	2099	2019	4119
Philippines	5083	-119	4964
Thailand	5832	3683	9515
ANZ	5295	-1537	3758
CUS	60466	5972	66438
Japan	74939	4815	79754
OAE	57362	4559	61921
EU	38188	-17230	20959
ROW	14542	-894	13648
Total	**277315**	**415**	**277731**

Note: Estimates based on deviations of quantity from baseline

Table 11. Summary of Impacts of APEC Trade Liberalization

(Unit: Million $)

Exporter/Importer	APEC	Non-APEC	Total
APEC	**224,585(92.37%) (80.99%)**	**18,539(7.63%)**	**243,124(100%)**
Non-APEC	52,731 (19.01%)	-18,124	34,607
Total	**277,315 (100%)**	415	277,731

3.3 Impact of Economic Reforms on Trade Patterns

The impact of economic reforms on national real income varies greatly across the economies. The five economies (Thailand, Indonesia, Malaysia, the Philippines and Korea) which were directly affected by the recent economic crisis will achieve great improvements in terms of their real income. Other, indirectly affected, economies will generally see slight improvements. Some APEC members, however, will record negative growth rates. This is because these economies remain relatively less competitive, compared with the crisis affected economies, since the latter economies are actively enhancing their competitiveness by adopting reform programs. As the five Asian economies improve competitiveness, price levels move in the opposite direction to regional GDP. Those economies will experience a decreasing trend in their price levels of, between –3 percent and –7 percent, while the rest of the economies will show a slightly increasing trend of between 0.3 percent and 1 percent.

With respect to trade volumes, the impact of economic reforms differs greatly among the directly and indirectly affected economies. The export and import growth rates of the five Asian economies will be far greater than those of the rest. The trade growth rates of the latter are expected to be slightly positive or even negative. The same is true for imports with an average high growth rate of 23.5 percent for the five Asian economies and only a slight growth rate of under 3 percent, for the rest.

Table 12. Impact of the Economic Reforms of the Asian Crisis Afflicted Economies
(Accumulated Percentage Deviations from Baseline)

(unit: %)

	Real Income	Price Level	Regional Exports	Regional Imports
Indonesia	37.67	-7.25	34.99	30.48
Korea	17.59	-2.49	20.17	14.75
Malaysia	26.52	-3.52	26.21	21.34
Philippines	24.94	-3.41	14.41	23.25
Thailand	33.72	-3.02	32.28	27.49
ANZ	0.04	0.96	-0.34	1.49
CUS	0.01	0.37	0.67	0.57
Japan	0	0.75	1.01	2.23
OAE	-0.01	0.33	0.8	1.07
EU	0.01	0.39	0.26	0.18
ROW	0.03	0.48	0.16	0.59

In order to calculate percentage deviations from a baseline simulation, differences in the growth rates of capital inflows and productivity in the two different scenarios are taken as shocks for the simulation. That is, the model analyzes the impact from the perspective of supply, assuming the increase in primary production factors in those five economies. Our preliminary estimations suggest that most of the impact is to be borne by the Asian crisis afflicted economies with marginal impact on the other economies. Thus, Table 13 reports percentage deviations of production only for the five Asian economies.

Table 13. Percentage Deviation of Sectoral Production from Baseline

(unit: %)

	Indonesia	Korea	Malaysia	Philippines	Thailand	World
Primary Industry	28.51	8.81	27.20	21.64	26.71	1.21
Resources	27.46	8.91	26.49	25.44	27.04	1.37
Textiles	44.93	15.89	30.65	22.15	39.86	0.95
Clothing	68.67	16.28	46.04	20.86	46.57	0.82
Chemical Plastic	44.11	17.93	27.18	26.66	38.00	1.09
Metal	57.42	27.54	35.40	24.65	55.06	2.23
Metal Products	51.42	21.78	33.90	24.93	37.74	0.56
Transportation Equipment	70.26	28.70	54.46	36.83	44.57	0.97
Electrical Equipment	47.87	21.59	25.87	10.27	44.14	1.19
Machinery	36.90	23.36	22.11	7.56	38.67	1.68
Other Manufacturing	52.02	18.45	28.01	26.50	38.67	0.88
Services	43.48	18.66	26.26	28.83	33.73	0.78

As capital inflows and productivity increase, production, in all sectors, will substantially increase in these economies. Indonesia, which is assumed to benefit from the relatively high capital inflows and productivity growth in the reform scenario, is expected to have higher production growth rates than the other economies. Indonesia is forecast to increase its production by 29 to 70 percent while Korea's sectoral production growth rates are predicted to be 9 to 29 percent.

Though all sectoral production levels are expected to grow when the crisis affected economies undertake economic reforms measures, the transportation equipment industry is anticipated to increase its production level to the largest degree. This is similar to the production changes predicted under the baseline simulation. Malaysia and Indonesia will increase their production of transportation equipment by 55 and 70 percent, respectively. On the other hand, production growth for the primary sector will be relatively lower than the other sectors.

Table 14. Percentage Deviation of Sectoral Exports from Baseline

(unit: %)

	Indonesia	Korea	Malaysia	Philippines	Thailand	World
Primary Industry	36.63	2.35	31.64	28.34	23.90	1.42
Resources	15.06	-21.24	23.20	19.06	11.61	2.16
Textiles	27.48	13.35	17.85	8.86	24.49	1.81
Clothing	80.54	16.94	51.34	19.11	59.81	1.85
Chemical Plastic	26.77	12.68	17.96	5.00	26.87	1.94
Metal	47.10	27.66	26.54	18.38	46.39	3.08
Metal Products	54.60	23.29	34.96	6.48	30.97	1.51
Transportation Equipment	98.41	37.36	65.28	31.68	56.76	1.24
Electrical Equipment	57.55	21.28	24.88	8.14	43.25	2.22
Machinery	20.78	20.52	21.41	6.05	34.87	3.04
Other Manufacturing	53.53	13.70	25.54	15.25	35.12	1.86
Services	36.68	17.05	24.26	15.50	21.60	1.84

As substantial changes in production are measured in the economic reform scenario, substantial trade expansions are expected for the crisis affected economies. The exports and imports of the four most seriously afflicted economies, and the Philippines, will increase sharply due to the enhanced international competitiveness after embarking on programs of economic reform. The changes in the trade volumes in other regions will be marginal. Indonesia and Thailand will increase exports by noticeable rates in most sectors. These two economies will expand their exports of transportation equipment and clothing by 98 and 81 percent and 57 and 60 percent, respectively. The other sectors, expecting a sharp increase in exports, are metal and metal products, machinery, electrical goods, and chemicals.

The last column of Table 14 presents the percentage deviations of global exports from the baseline. According to the table, the sector with the highest export growth rates will be metals because of the sharp increases in production and exports for metal-based industries such as transportation equipment and metal products. However, except for Korea and Thailand, the export growth rate of the metal industry is expected to be in the middle range for these Asian economies. Thus, it can be inferred that the major production increases in the world metal industry will originate from other economies. In identifying the sources of this growth in metal exports, it is found that North American and Japanese will earn 6.6 and 26 billion US dollars respectively, more by exporting metal and that other APEC economies, including Chinese Taipei and Singapore, will increase their exports of metal.

Table 15. Percentage Deviation of Sectoral Imports from Baseline

(unit: %)

	Indonesia	Korea	Malaysia	Philippines	Thailand	World
Primary Industry	8.33	12.30	10.77	7.40	16.66	1.46
Resources	38.92	21.32	20.46	25.40	32.49	2.17
Textiles	51.06	10.96	24.46	20.44	24.62	1.81
Clothing	20.94	8.86	23.09	19.32	5.92	1.85
Chemical Plastic	37.61	15.11	24.26	25.31	30.34	1.96
Metal	36.91	15.30	27.53	17.77	33.37	3.11
Metal Products	25.57	12.09	14.67	29.20	23.19	1.52
Transportation Equipment	28.97	6.11	15.29	32.22	23.25	1.25
Electrical Equipment	23.20	10.55	21.99	21.76	28.03	2.2
Machinery	37.49	15.93	23.91	25.17	28.58	3.04
Other Manufacturing	26.75	15.29	18.13	24.16	24.64	1.85
Services	20.31	9.20	14.53	24.08	25.66	1.73

The import patterns of the crisis affected economies differ significantly from their export patterns, though all the economies will see increases in imports with the implementation of reforms. The most significant difference will be the high growth of metal imports. As discussed above, the high production and export of metal-based products will require substantial imports of metal for intermediate inputs. In a similar manner, Indonesia, the Philippines and Thailand will import substantial amounts of textiles as their exports of clothing increase. Meanwhile, imports of machinery are also expected to increase in all five economies due to the increased production activity.

From the estimation, it is noted that the crisis affected economies will benefit greatly from economic reforms. This implies that these afflicted economies will be most active in reforming their economic systems.

4. Conclusion

In this paper, an attempt was made to forecast the trade patterns of the APEC economies in 2010, and to analyze the impacts of APEC trade liberalization and the economic reforms of the crisis affected economies. Trade liberalization in APEC will contribute to expanding trade among the APEC economies. Even though APEC trade liberalization will be extended to non-APEC regions unilaterally, the economic gains of the APEC members will be considerable owing to the increasing intra-APEC trade. The Asian crisis affected economies will maximize their gains by embarking on and sticking to their reform policies.

Considering the deepening economic interdependence within the Asian region, regional cooperation to overcome and prevent another economic crisis is essential. This paper shows that the benefits of trade liberalization will be shared by the APEC economies, since intra-regional trade is substantial among the APEC member economies. A number of recent studies show that Asian developing economies are expected to be among those making the largest economic gains due to the implementation of trade liberalization measures under the APEC initiatives. Trade liberalization measures within the region, including tariff reductions, will surely stimulate additional trade, strengthen economic ties among the APEC economies and

improve the welfare level of the region. Therefore, it is necessary for the Asian economies to remain committed to trade liberalization (including trade facilitation measures such as improving customs clearance, and harmonization of standards and conformance issues, such as recognition of tests) in order to overcome the crisis and to maintain their economic growth.

At the same time, the economies should reform their financial systems and improve the international competitiveness of their industries. This will, in turn, lead to full access to international credit. Those economies that have received rescue packages coordinated by the IMF have already promised to implement reform packages. Among them, Korea is regarded as one of most successful, recovering from the financial crisis in a short period of time. Much of the success was due to the country's quick response and faithful reform efforts since the outbreak of the crisis. Considering that the Asian financial crisis broke out partly due to the deterioration of trade balances and over-capacity in some industries such as the semiconductor, chemical, and steel sectors, it will be required that the affected economies enhance their competitiveness through restructuring in order to prevent future financial crises.

This study is, as yet, incomplete and it is limited in many regards. First, the model utilized in forecasting trade patterns assumes perfect competition with constant returns to scale. However, economies of scale are important and recognition of this factor will lead to more accurate estimates in some industries. Secondly, the paper discusses estimated changes of production and trade by sector, but more detailed analyses for sector and economy-specific estimations will be needed in order to understand the long-term impacts of trade liberalization and economic reforms.

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Individual Report III (Chinese Taipei)

Competitiveness of SMEs in the Past and beyond the Crisis - An Analysis of Vertical Disintegration

(Contents)

Competitiveness of SMEs in the Past and beyond the Crisis - An Analysis of Vertical Disintegration

1. Introduction: The Significance of Vertical Disintegration

The Asian financial crisis has had a wide-ranging impact on APEC member economies. It has, in particular, greatly affected and had profound implications for small and medium-sized enterprises (SMEs). The SME sector is the core of most economies and constitutes the bulk of the private sector, which is why its development is an important feature of APEC work. Therefore, it would be worthwhile to analyze the role of SMEs, examine the conditions for the healthy, sustainable development of the SME sector, and explore opportunities and future prospects for the sector. It is also suggested that a well developed SME sector could contribute to cushioning the adverse impacts of external crises on the economy. For example, *The Economist* (Nov. 7, 1998, *Taiwan Survey*, p.9) quoted an analyst as saying: "The sheer number of small and medium-sized companies means greater competition, which lessens the risk of poor management and the kind of large-scale industry failures that lead to a national crisis."

This paper aims to develop a theory of vertical disintegration in order to analyze SMEs. Vertical disintegration is a situation where each firm specializes in a specific stage of the production process. The semiconductor industry of Chinese Taipei is a good example of vertical disintegration. In the "upstream" of this industry, all of the design houses specialize in the IC design and are not involved in IC manufacturing, while in the "downstream," IC foundries typically specialize in producing wafers without engaging in design or marketing. One famous example is the Taiwan Semiconductor Manufacturing Company (TSMC), which is the world's leading IC foundry manufacturer.[1]

According to industrial organization theory, the economic environment is essentially characterized by its corresponding industrial organization, which, in turn, is determined by *the degree of vertical integration*, conglomeration, the magnitude of the MES (minimum efficiency scale), the level of the entry barrier, the number of sellers and buyers, etc. (Scherer and Ross, 1993, Ch. 1). It provides a justification for our focus on vertical disintegration in studying the SME issues.

Chinese Taipei is well known for the prosperous development of its SMEs. However, vertical disintegration also is one significant feature of Chinese Taipei's economy. The footwear industry is a case in point.

In conducting a comparative study of the footwear industry in Chinese Taipei and Korea, Levy (1991, pp.154-5) observes that Chinese Taipei has a greater preponderance of SMEs than South Korea. Going on to examine the industrial organization in the two economies, Levy (1991, p.156) finds that:

> "The Taiwanese footwear industry is organized via the subdivision among independent firms of the various processes of production. Some specialize in lasting (the assembly of uppers and soles); some in

[1] In studying the semiconductor industry of Chinese Taipei, Hong (1997, p.55) notes that "the TSMC was established as a pure foundry, that is, it only produces wafers without engaging in design or marketing… This turned out to be a very important decision because within a year of its formation, about 40 small design houses were set up in Hsinchu."

> the manufacture of soles; some in the cutting of materials for footwear uppers; and some in the stitching of uppers. It is rare for a Taiwanese footwear firm to perform inhouse more than at most two of the various sub processes. … Although evidence is not adequate to identify at what point in the expansion of the Taiwanese footwear industry this reliance on subcontracting first emerged, this way of doing business appears to be deeply rooted in Taiwan; the proliferation of subcontracting relationships has been documented in industries as disparate as machine tools and the manufacture and assembly of electronics products."

In other words, Chinese Taipei's footwear industry is vertically disintegrated.[2] By contrast, Levy (1991, p.159) notes that "throughout the 1970s Korean manufacturers were organized on a vertically-integrated basis, performing in-house the various tasks of sole manufacture, cutting, stitching of uppers, and lasting."[3]

Remark 1: *In the literature of development economics, a vertically disintegrated industry is usually referred to as an industry with a production (subcontracting) network, e.g., Howard (1990), van Dijk (1995), Kawakami (1996) and Chen and Liu (1997). One exception is Chu and Li (1996), who formally apply the theory of vertical integration to conduct a comparative study of the bicycle industry in Chinese Taipei and Korea. They have also already observed that the degree of vertical integration plays an important role in the performance of an industry.*

Silicon Valley is another example where a vertically disintegrated industrial organization plays an important role in a success story.[4] During the 1970s, northern California's Silicon Valley and Boston's Route 128 attracted international acclaim as the world's leading centers of innovation in electronics. However, during the early 1980s, the leading producers in both regions experienced crises of their own. Silicon Valley chipmakers relinquished the market for semiconductor memory to Japanese competitors, while Route 128 minicomputer companies watched their customers shift to workstations and personal computers. Saxenian (1994, p.1) observes that "The performance of these two regional economies diverged, however, in the 1980s. In Silicon Valley, a new generation of semiconductor and computer start-ups emerged alongside established companies. The dramatic success of start-ups such as Sun Microsystems, Conner Peripherals, and Cypress Semiconductor, and the continued dynamism of large companies such as Hewlett-Packard and Intel, were evidence that Silicon Valley had regained its former vitality. Route 128, in contrast, showed few signs of reversing a decline that had begun in the early 1980s." Saxenian utilizes the "industrial system" to account for Silicon Valley's super adaptive

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[2] Here we provide anecdotal evidence of the high vertical disintegration in the Chinese Taipei economy. Appendix A goes a step further by analyzing the core-satellite relationship, census data, and so on, to sketch a more comprehensive picture of the vertical disintegration in Chinese Taipei.

[3] Chu (1997, p.63), emphasizing that the Chinese Taipei bicycle industry is vertically disintegrated, notes that "As for the present situation, we find that, from a recent survey, over 90% of the bicycle assemblers produce no parts themselves, except for the frame. The same survey also shows the part producers to be highly specialised, with over 90% producing only one type of bicycle part." Levy and Kuo (1991, p.365) also note that the Korean keyboard industry is much more vertically integrated than Chinese Taipei's.

[4] The similarity between Chinese Taipei and Silicon Valley has already been noted by Kraemer and Dedrick (1996, pp.13-14). They observe that "Taiwan stands out as perhaps the greatest national success story in the PC era, especially considering that its success was built on the efforts of domestic entrepreneurs. … All of these elements make for a story as complex and interesting as that of Silicon Valley." Sesser (1999) also notes that "When I visited Taiwan this month, I was surprised to see another side of the high-tech industry booming alongside manufacturing. Venture capitalists and would-be entrepreneurs were practically tripping over each other racing to establish start-up companies, many of them involved with the Internet. It's the sort of atmosphere I had witnessed only in California."

capacity during the 1980s, and notes that Silicon Valley has a network-based and decentralized industrial system (p.9) while Route 128 is dominated by a small number of relatively integrated corporations (p.3).

Saxenian (1994, p.5) notes that "The Japanese corporation is more internally decentralized and more open to the surrounding economy than the traditional large American corporation. Producers of electronics, autos, and machine tools, for example, rely on extensive networks of small and medium-sized suppliers, to which they are linked through ties of trust and partial ownership."[5] He also attributes the successes of these industries to their network-based industrial systems (p.4).

Remark 2: *As mentioned in Remark 1, a vertically integrated industry is usually referred to as an industry with a production network. However, in an industry with a network, it is important to notice the degree of independence of the subcontractors. For example, in a comparative study of the East Asian computer industry, Kraemer and Dedrick (1996, Ch.4, pp.7-8) notice that the subcontractors in both Japan and Chinese Taipei have a high degree of independence while those in Korea do not.*[6] *Howard (1990, p.100) also notices that, in Silicon Valley, small companies have a high degree of independence*[7]*. Strictly speaking, an industry with a production network can be called a vertically disintegrated industry only when the subcontractors have a high degree of independence.*

The remainder of this paper is organized as follows. It has been shown that one outstanding feature of both Silicon Valley and Chinese Taipei is vertical disintegration, and this feature might be a crucial factor for their impressive performance. Therefore, one purpose of Section 2 is to develop a theoretical framework to evaluate the vertical disintegration. Section 3 provides empirical analysis of the performance of SMEs. Section 4 applies the theoretical framework developed in Section 2 to study whether the experience of vertical disintegration is transferable to other economies. Section 5 contains conclusions, explanations for the performance of Chinese Taipei's SMEs, and implications for entrepreneurship, corporate governance, and the SME sector.

2. Theoretical Analysis

[5] This observation is consistent with one finding of Uryu, Sunada and Nakahashi (1993), who argue that the Toyota Group and the Nissan Group are business groups of the vertical "keiretsu" type, and they are more "open" than either GM or Ford.

[6] They state that "Until the mid-1980's, the chaebol tended to produce most components in-house. However, as a result of labor strife and rising wages since 1987, the chaebol have been anxious to shift labor costs to their suppliers. Small and medium-sized enterprises (SMEs) are generally locked into the production network of one chaebol and lack the ability to innovate and improve their competitiveness. Here the situation bears some similarities to Japan's keiretsu system, but is actually much worse. Most Japanese equipment and components suppliers are part of a keiretsu network, but sell outside that network to both domestic and foreign customers. … Chinese Taipei's SMEs were able to gain a leading position in many computer components and peripherals while the PC industry was in its early development, and Korea has yet to make a dent in those now large markets."

[7] He states that "But in no sense do these big companies dominate the network. Indeed, in many respects, exactly the opposite is the case. As these examples suggest, cooperation among Silicon Valley semiconductor companies does not lead to the kind of tight integration that hinders competition. Both customers and suppliers make an explicit effort to avoid dependence on any one company and to preserve their autonomy. For example, most Silicon Valley companies prefer that no single customer account for more than 20% of a supplier's output."

The above section shows that one outstanding feature of both Silicon Valley and Chinese Taipei is vertical disintegration, and this feature might be a crucial factor for their impressive performance. Therefore, one may ask how we can evaluate the vertical disintegration. One purpose of this section is to develop a theoretical framework to evaluate the vertical disintegration by utilizing the theory of industrial organization, trade theory, principal-agent theory, institutional economics, cooperative game theory, and microeconomics. Subsection 2.1 applies the concepts of agency and transaction costs to evaluate the vertical disintegration from a static viewpoint. Subsection 2.2 evaluates the vertical disintegration from an evolutionary viewpoint, that is, it examines how the entry behavior of firms is affected by the vertical disintegration. Because it is often noted that personal relationships play an important role in doing business in both Silicon Valley and Chinese Taipei,[8] this phenomenon might be closely related to vertical disintegration. Thus, Section 2.3 applies the theoretical framework developed in Section 2.1 to explain and evaluate the networks of personal relationships. Moreover, Section 2.3 utilizes the theory of personal relationships to analyze the venture capital industry, which plays an important role in activating small start-ups. Because a vertically disintegrated industry accomplishes scale economies via *Marshallian external economies* (see Appendix B), which cause some unusual and important properties, Subsection 2.4 summarizes these properties of the Marshallian external economies. These properties play important roles in addressing whether the experience of vertical disintegration is transferable to other economies (see Section 4).

The framework developed in this section is also capable of evaluating horizontal disintegration (see Remark 5) though it is developed to study vertical disintegration.

2.1 A Static Viewpoint: the Tradeoff between Agency Cost and Transaction Cost

It is needless to say that the performance of an industry is essentially determined by whether it can realize scale economies. As mentioned above, as in Chinese Taipei's economy, there are usually many SMEs in a vertically disintegrated industry. Therefore, in such an industry, it is often argued that scale economies cannot be realized since it is a widespread belief that only large enterprises can accomplish scale economies (Harrison, 1995). However, in Appendix B, it is shown that a vertically disintegrated industry is also able to realize scale economies via the so called *Marshallian external economies*. *Accordingly, from the viewpoint of scale economies, it does not make a difference whether an industry is vertically integrated or not.* According to institutional economics and the principal-agent theory, both agency cost and transaction cost are decisive factors in determining the performance of the economy. This subsection is thus to utilize agency cost and transaction cost to evaluate the vertical disintegration.

[8] Wong (1998, p.37) also observes that one distinctive institutional characteristic of Hong Kong, China is the reliance on personal networks.

Agency cost

Imagine that a principal, such as a stockholder, contracts with an agent, such as a manager, to take some action that benefits the principal. The *principal-agent literature* emphasizes that if the principal cannot practically monitor the agent all the time, the agent may steal, not work hard, or engage in other opportunistic behavior that lowers the productivity, i.e., there is an "*agency gap*" between the principal and the agent.[9] The cost caused by this agency gap is referred to as "*agency cost*." In modern corporations, there is a so-called *internal control system* headed by the board of directors to handle the agency gap problem. However, after conducting an extensive survey, Jensen (1993, p.850) concludes that "substantial data support the proposition that the internal control systems of publicly held corporations have generally failed to cause managers to maximize efficiency and value," and hence there is an "agency gulf" rather than an agency gap. This implies that the agency gap is an important issue in the modern economy.

As mentioned above, in a vertically disintegrated industry, the average size of enterprises is relatively small, and hence the gap between the managers and stockholders is narrowed. For example, in a small firm, the manager and owner usually are the same person, and hence the agency gap does not even exist. Therefore, the agency cost is less significant in a vertically disintegrated industry than a vertically integrated one.

The contract theory is next applied to formally explain why a vertically disintegrated industrial organization can attain maximum production efficiency. It is known that, in writing a contract between a principal and an agent, there is a trade-off between *efficiency in production* and *risk sharing* (Perloff, 1998, Section 20.3). For example, imagine that, in agriculture, landowners (principals) contract with farmers (agents) to work their land. Farmers may work on land rented from a landowner (the agent bears all of the risk), work as employees for a time rate (hire contract, the principal bears all of the risk), or sharecrop. Farmers who keep all the marginal profit from additional work those who rent the land for a fixed fee work hard and attain maximum efficiency in production. However, if farmers are more risk-averse than landowners then such a contract has the weakness that farmers bear all of the risk and they cannot survive during bad times. The opposite holds for the hire contract.

There are some important implications of the above contract theory. First of all, *an economy is essentially characterized by the way in which the risk is shared.* Secondly, from the viewpoint of production efficiency, we had better use a contract where the agent bears all of the risk. If the agent is risk-neutral then we face no dilemma: we can use a contract in which the agent bears all of the risk, and therefore attain the maximum production efficiency without inviting any negative side effect. However, if the agent is more risk-averse than the principal is then we are caught in a dilemma: the efficiency in production must be sacrificed to some extent in order to secure risk sharing. Thirdly, in an economy, which type of contract is actually chosen depends upon the attitude towards risk-taking. For example, in an economy where economic agents are ready to take a risk, it is expected that the kind of contract where the agents bear all of the risk will prevail.

[9] Please refer to Perloff (1999, Ch. 20) for an introduction to the principal-agent literature.

As mentioned above, in a vertically disintegrated industry, it is typical to have production subcontracting networks. Comparing the arrangement under a production subcontracting network with the hire contract where the subcontractors are instead hired by the contractor as employees reveals that one essence of the network is that the subcontractors bear the risk and hence it attains higher production efficiency. [10]

Transaction cost

According to institutional economics, one weakness of vertical disintegration is that it incurs transaction costs since a vertically disintegrated industry uses a market mechanism to allocate resources. The transaction costs are the expenses of finding a trading partner and making a trade for a good or service other than the price paid for that good or service. These costs include the time and money spent to find someone with whom to trade, and then to specify the details of the good or service. This type of transaction cost might be referred to as a *technical transaction cost*. Other transaction costs include the costs of negotiating, writing and enforcing a contract, such as the cost of lawyers' time. This type of transaction cost might be referred to as a *strategic transaction cost*.

Strictly speaking, a vertically integrated firm incurs the technical transaction cost, at least to some extent, when it conducts an internal transaction. For example, in a vertically integrated firm, if one department receives an order from another department then these two departments must spend time and money to specify the details for the order.[11] Therefore, we argue that the transaction cost that is incurred by vertically disintegrated firms but not incurred by vertically integrated firms is the strategic transaction cost only. [12]

Next we show that the strategic transaction cost is positively correlated to *the degree of asset specificity*.[13] Imagine a vertically disintegrated industry where there is only one seller and one buyer for one intermediate good, and both the seller and the buyer should invest assets which are *specific* to the trade among them (for example, the seller must buy machines which are dedicated to the production of the intermediate good, and the buyer must spend money and effort to promote the final product which uses the product of the seller as an essential intermediate good). A crucial aspect of *specific investment* is that even though the seller and the buyer may select each other *ex ante* in a pool of competitive sellers and buyers, they end up forming an *ex post bilateral monopoly* in that they have an incentive to trade with each other rather than with outside parties. Under a bilateral monopoly, each party may act strategically to appropriate as much as possible the total gains from trade. For example, one party may use the threat of not trading to appropriate

[10] In the production networks, a typical contractor (principal) usually regards its subcontractors (agents) as a "safety valve" for market fluctuations, i.e., the contractor puts orders out when they grow and exceed its capacity and take the production steps in when the demand decreases (Kawakami, 1996, p.35-36). In other words, subcontractors bear all of the risk. Therefore, it is expected that the production network (i.e., vertical disintegration) prevails only when the willingness to take risk is strong enough.

[11] Stigler (1968, p.139) has a similar interesting observation, noting that "Those too numerous people who believe that transactions between firms are expensive and those within firms are free will do well to study the organization of England during this period of eminence…"

[12] This argument can be justified by the finding of Tirole (1988, p.26) that one essential difference distinguishing vertically integrated firms from vertically disintegrated ones lies in *the authority structure*, with a vertically integrated firm having a "*sequential authority mechanism*" to overcome the strategic behavior caused by bilateral monopoly situations.

[13] For the details about the asset specificity please refer to Tirole (1988, Section 1.3).

the gains from trade that arises from the other party's specific investment. Williamson (1975) calls this strategic behavior *opportunism*. Accordingly, it may not be easy, or even possible, for both parties to reach an agreement on the terms of trade to conduct the trade, i.e., there is likely to be a stalemate. Furthermore, the opportunism causes the specific investment to be suboptimal and hence there is efficiency loss even when the trade is eventually realized (Tirole, 1988, p.25). Therefore, in vertical disintegration, an important concern is how to deal with the opportunism and the strategic transaction cost is relatively high.

It is important to note that the strategic transaction cost decreases with the increase of *the size of the whole industry*. This is because if the size of an industry is large enough then there are many sellers and buyers for any intermediate goods, and hence both the asset specificity and all problems caused by this specificity disappear.[14] This intuitive argument can be formally justified by a proposition of the cooperative game theory that if both the number of sellers and the number of buyers are large enough then there exists a unique set of terms of trade (Varian, 1984, p.238), and hence both the strategic behavior and the strategic transaction cost automatically vanish (i.e., the terms of trade become *impersonal*).

To sum it up, one advantage of vertical disintegration is that its agency cost is relatively insignificant while its potential disadvantage is that it may incur transaction costs. However, the above disadvantage can be overcome if the size of the whole industry is large enough.

Remark 3: *In other words, a vertically disintegrated industry organizes its economic activities by utilizing the "invisible hand" while an industry with vertically integrated firms utilizes the "visible hand" to organize its economic activities. A necessary condition for the invisible hand to work smoothly is that the market size must be large enough.*

Remark 4: *Risk sharing is often utilized to provide a justification for either vertical or horizontal integration. However, this is not the case when the firms are stock companies. If a stock company, Company A, integrates another stock company, Company B, then, as is argued under the contract theory, the production efficiency is likely to be reduced although these two companies can share risk with each other. As a matter of fact, we argue that there is a way that risk sharing can be attained without inviting the negative side effect. At first, note that stock companies are for their stockholders, not for their managers. If the stockholders diversify their investments among different stock companies and, meanwhile, keep the companies specialized, then the stockholders can share risk with each other without inducing the side effect. This is because the stockholders are not decision-makers of the companies, and hence their risk sharing does not destroy the incentive system for the managers, who are the decision-makers of the companies.*

Remark 5: *The framework developed above is next utilized to evaluate horizontal*

[14] In the literature regarding either SMEs or development economics, it seems that the asset specificity draws little attention. However, asset specificity is related to the degree of "independence of part suppliers." Referring to Chinese Taipei's bicycle industry, Chu (1997, p.64) notes that "on average, each bicycle producer has about 60 parts suppliers and each parts producer supplies up to 20 bicycle assemblers. Thus, the degree of dependence on a particular supplier or buyer is not particularly high." Please also refer to Remark 2 for more details about the independence.

disintegration. As with vertical disintegration, horizontal disintegration also has lower agency cost than horizontal integration. However, unlike vertical disintegration, the horizontal disintegration does not necessarily introduce the transaction cost. One reason runs as follows. Let's begin by noting that if an industry is vertically disintegrated then the firms in this industry are forced to trade with each other. However, this is not the case when an industry is horizontally disintegrated. For example, imagine an economy where each firm specializes in a specific final good (i.e., horizontally disintegrated) and each firm manufactures all of the intermediate goods by themselves (i.e., vertically integrated). In this economy, these firms need not conduct transactions with each other. Therefore, horizontal disintegration can lower the agency cost without introducing the transaction costs. Accordingly, horizontal integration cannot be justified by the transaction cost argument.

2.2 An Evolutionary Viewpoint: MES and Entry Barrier

The level of the entry barrier is an important factor in determining the performance of an industry according to industrial organization theory. This subsection studies the relationship between entry barrier and vertical disintegration.

The scale beyond which a firm no longer enjoys cost saving as it further enlarges its scale is the minimum efficiency scale (MES) of the firm. It can be shown that the higher the MES is, the higher the entry barrier is, at least when there are capital market imperfections.[15] Furthermore, the level of the MES is increased with the increase of the degree of vertical integration. The reason runs as follows. In an industry with vertically integrated enterprises, survival as a nonintegrated entry is precarious since those vertically integrated enterprises may react strategically to foreclose the nonintegrated entry.[16] Therefore, entrants may feel compelled to enter on a fully integrated basis, with a considerably larger capital investment (Scherer, 1980, p.303).[17] On the contrary, in a vertically disintegrated industry, a start-up is allowed to specialize in whatever its comparative advantage is in, and hence the MES is relatively low. Silicon Valley, again, provides an example for this argument.

In studying Silicon Valley, Saxenian (1994, p.40) notes that *a network of product suppliers and service providers* allowed the start-ups to focus on specific areas of expertise, without the burden of manufacturing every part of a product or performing every organizational function:

> "An expanding network of specialist suppliers and service providers also facilitated the start-up process. The semiconductor equipment and materials industry flourished in the 1970s as engineers left established semiconductor companies to start firms that manufactured capital goods such as diffusion ovens, step-and-repeat cameras, and testers, and materials and components such as photo masks,

[15] Chicago School economists typically insist that capital market imperfections either do not exist or are of little consequence. However, Scherer (1980, p.304) argues that "On this the Chicagoans are almost surely wrong, since it is definitely more difficult or costly for small new entrants to raise capital than for established firms."

[16] For example, Scherer (1980, p.303) notes that "Supplies of needed inputs may be cut off at will or priced to squeeze independent downstream firms' processing margins; and customers who are also competitors may cut back orders sharply and favor their integrated supply units, especially in times of slack demand."

[17] Stigler (1968, p.138) has a similar argument, asserting that "Again, it is possible that vertical integration increases the difficulty of entry by new firms, by increasing the capital and knowledge necessary to conduct several types of operation rather than depend on rivals for supplies or markets."

testing jigs, and specialized chemicals… This independent equipment sector promoted the continuing formation of semiconductor firms by freeing individual producers from the expense of developing capital equipment internally and by spreading the costs of development… A similar process occurred a decade later as independent suppliers of disk equipment and materials grew up alongside the region's flourishing disk drive industry. In addition, hundreds of small design firms, contract manufacturers, metalworking shops, software developers, and prototyping operations made their homes in Silicon Valley to serve its electronics producers. This localized technical infrastructure allowed the region's start-ups to focus on specific areas of expertise, without the burden of manufacturing every part of a product or performing every organizational function."

The SME Phenomenon and the Pace of Introducing New Product/Service

To sum it up, one evolutionary advantage of vertical disintegration is lowering the MES as well as the entry barrier. A low entry barrier has at least two important implications. First of all, it is easier for the SMEs to enter the market. Secondly, it is easier to develop a new product/service. This explains why Silicon Valley has a fast pace of introducing new product/service (Saxenian, 1991, p.281).

2.3 Reputation, Personal Relationships, Gentleman's Agreement, and Informality

It is often noted that personal relationships play an important role in doing business in both Silicon Valley and Chinese Taipei. We are now in a position to explain and evaluate the personal relationships. Subsection 2.1 establishes that enlarging the size of the industry overcomes the problem of opportunism since it decreases the degree of asset specificity. This subsection demonstrates that personal relationships also can deal with the problem of opportunism even when the degree of asset specificity is still relatively high. Moreover, the framework developed by this subsection will be applied to analyze the venture capital industry.

Recall that vertical integration is able to solve the opportunism caused by asset specificity. It is important to notice that *reputation* is a substitute for integration (Tirole, 1988, p.34). This is often true when economic agents engage in long-run relationships where agents have an incentive to avoid opportunistic behavior in order to create and maintain a good reputation. This is because the agents may realize that an agent that cheats runs the risk of losing future profitable deals with its partners.

The above reputation theory explains why, in Silicon Valley, as noted by Saxenian (1994, Ch.2), social and professional networks play an essential role in doing business. The value of personal relationships is emphasized, and the business culture is one of high-trust business relationships. Because Silicon Valley, as mentioned, has a vertically disintegrated industrial organization, opportunism is an essential concern, and hence an economic agent needs the networks to *ex ante* check the reputations of its potential partners and to *ex post* discipline its partners if they employ opportunism against it.

Emphasizing the value of personal relationships also generates many famous phenomena of Silicon Valley (Saxenian, 1994, Ch.2, p.63, Ch.6): greater loyalty to one's craft than to one's company, high employee turnover rates, information sharing, high technology diffusion, low separation between work and social life, and firms' boundaries being blurred.

Kraemer and Dedrick (1996, pp.27-8) also note that Chinese Taipei's companies do

business on the basis of personal relationships, referred to as *guanxi*, rather than on the legalistic, contractual basis favored by most American companies. The U.S. companies who have most successfully tapped Chinese Taipei's production network, such as Dell, Gateway 2000 and Packard Bell, operate like Chinese Taipei's companies. Their presidents come to Chinese Taipei and meet directly with the presidents of their Chinese Taipei partners, rather than sending their lieutenants. Some foreign MNCs have tried to operate outside the relationship network and have had serious problems.

Fast Turnaround Phenomenon

Kraemer and Dedrick (1996, pp.28) also observe that Chinese Taipei's fast turnaround time on new products is partly due to these personal relationships, where an engineer can call his former classmate at midnight to solve a technical problem. We are in a position to utilize the reputation theory to explain the fast turnaround phenomenon. Let us begin with noting that reputation is also a substitute for contract in solving the problem of opportunism (Tirole, 1988, p.34). This means that a *gentleman's agreement* is a substitute for a formal contract. Because bargaining, writing and enforcing a contract is costly and time-consuming (Tirole, 1988, pp.29-30), using gentleman's agreement can shorten the time.

As a matter of fact, we can utilize "informality" to summarize many properties deeply rooted in a vertically disintegrated system. "Informality (formality)" refers to a situation where agents utilize market mechanisms (organizations), gentleman's agreements (legal contracts) and the 'invisible hand' ('visible hand') to trade with each other. The internal management style of Silicon Valley is also characterized by informality. For example, Saxenian (1994, pp.53-4) notes that" Andre Delbecq and Joseph Weiss interviewed local electronics managers in the early 1980s… Their survey documents the highly intuitive and casual decision-making styles in Silicon Valley firms, the absence of concern with organization charts, procedures, or other formal mechanisms for control, the elimination of status barriers, and the general informality of workplace procedures, dress, and work styles." In contrast, Saxenian (1994, p.76) also notes that the old-line electrical producers and the newer electronics producers along Route 128 reproduced a traditional organizational model, which was a world governed by formal organizational charts, deliberate, analytical, and quantitative decision-making, and long-term strategic planning.

The Essence of Venture Capital Industry

It is known that the venture capital industry is a complement to technology-oriented start-ups, which are typically small. For example, Gompers (1999, p.206) notes that each year 1,000 to 2,000 of the nearly one million startup firms receive venture capital financing. The firms that receive venture capital are primarily high growth and high potential companies. This group includes industry leaders such as Microsoft, Netscape, Sun Microsystems, Apple, Genentech, Starbucks, and Staples. Therefore, recently it has become a main policy priority to develop a venture capital industry.

We are in a position to deeply analyze the venture capital industry. Let us begin by noting that it has high degree of informality. First, the venture capital industry is one where individual investors, known as "angels", are active and there is an angel network (Gompers, 199, p.207). For example, Wetzel (1987) estimates that 250,000 individuals are

active in the informal risk capital market and invest between $20 billion and $30 billion annually.

Second, the venture capital industry also has a highly intuitive and casual decision-making style. For example, Saxenian (1994, p.65) documents the following typical example: an engineer who founded a computer company stated that "When I started Convergent, I got commitments for $2.5 million in 20 minutes from three people over lunch who saw me write the business plan on the back of a napkin. They believed in me. In Boston, you can't do that. It's much more formal."

The companies financed by the venture capital industry typically are start-ups that have new ideas, have a large degree of uncertainty, and lack substantial tangible assets (Gompers, 1999, p.208). Because the targeted industries are new, the trades between the entrepreneurs and the potential "lenders" involve a high degree of asset specificity. Therefore, how to solve the opportunism problem is an important concern.

We now want to demonstrate that the essential feature of the venture capital industry is that reputation is an important measure in solving the opportunism problem. Recall that there are three alternatives always to solve the opportunism problem: vertical integration, complete contract and reputation. It remains to establish that neither vertical integration nor contract can solve the problem.

It is clear startup companies are unlikely to receive significant bank loans (Gompers, 1999, p.208). As a matter of fact, this means that "vertical integration" is not a solution to the problem. The reason runs as follows: In essence, vertical integration is an arrangement whereby two economic agents cooperate to achieve a common goal, one gets fixed pay, the other gets the residual, and the economic agent who claims the residual has the authority to determine how to achieve the goal (for example, the arrangement between an employer and an employee). Therefore, in essence, the relationship between a borrower and a lender is similar to an arrangement of vertical integration.

It is also clear that it is very costly and time-consuming for the venture capitalists to bargain, write and enforce contracts with the startups. Therefore, it is rational to utilize a network of personal relationships to *ex ante* check the reputation of potential partners and *ex post* discipline those who betray their partners, especially when there are established effective networks of personal relationships and quick decision-making is required.[18]

The above theory can offer an alternative explanation for a typical practice of the industry, namely, *syndication* of venture capital investments. Most venture capital investments are made in syndicates. One venture capital firm will originate the deal and look to bring in other venture capital firms. Three explanations are provided for this syndication in the literature (Gompers, 1999, pp.220-222). First of all, it allows the venture capital firm to diversify into more investment. Another explanation is that bringing in other venture firms that provide their own due diligence acts as a second opinion on the investment opportunity. The third purpose is to increase the bargaining power of the venture capitalists. Our theory implies that the syndication has a *reputation effect*, namely, the

[18] The venture capitalists typically are active in monitoring the progress of firms (Gompers, 1999). This is another measure to prevent the opportunism.

syndication sends a signal to the entrepreneur to be financed by the venture capital firms that the entrepreneur will ruin his/her reputation among the circle of venture capitalists if he/she acts opportunistically.

2.4 The Three Properties of the Marshallian External Economies

Marshall's Rule and Market Size Effect

The external economies have three important properties. First of all, in an industry with external economies, a firm can generate external benefit to other firms. Accordingly, in order to have an optimum industry size, such an industry should be subsidized. This is the so-called *Marshall's rule* (Aoki, 1971, p.48). This theoretical finding provides a justification to subsidize a vertically disintegrated industry that is composed of many specialized small firms and realizes the scale economies by the specialization between firms. Second, in *a closed economy*, if the external economies are significant enough then the industry can survive only when the size of the closed economy is large enough (Chang, 1985, p.16).[19] This is the so-called *market size effect.* Accordingly, it is not appropriate to develop an industry with significant external economies if the relevant economy size is not large enough.[20]

Multiple Equilibria, History, and Expectations

Third and perhaps the most important, if the external economies are significant enough then there are two stable equilibria: one is a desired equilibrium where the industry with external economies survives and the other is an undesired equilibrium where the industry dies out (Chang, 1985).[21]

It is emphasized in the literature that a world with multiple equilibria is significantly different from the standard competitive world (Krugman, 1991). In a world with multiple equilibria, either historical accidents or expectations are decisive in determining the eventual outcomes; i.e., either historical accidents or expectations are able to lead two economies to different long-run outcomes even when these two economies have the same tastes, technology, and factor endowments. If the economic agents are backward-looking (i.e., the resources move gradually in response to differences in *current earnings*) then the eventual outcome depends upon the initial conditions, i.e., divergences in initial conditions tend to grow over time and "history" matters. If the economic agents are forward-looking (i.e., resources move in response to the differences in expectations of *future earnings*) then the long-run outcome is at least potentially determined by the expectations, that is, if everyone thinks that the economy will end up in a particular equilibrium, then it will.

Indeterminacy

[19] In the model studied by Chang (1985), the size of the whole economy is measured by the size of the population.
[20] In case of completely free trade, the relevant economy size is the size of the whole world economy.
[21] In trade theory, it has been known for a long time that with external economy there exist multiple equilibria (Helpman, 1984, p.339).

In a model with multiple equilibria, one would like to ask the following question: What are the determinants of a particular equilibrium? Unfortunately, it is shown that the eventual outcome is determined either by historical accidents or by subjective expectations. Accordingly, the eventual outcome is not systematically determined and systematic determinants for a particular equilibrium do not exist!

Policy Implications and the Big Push

It is important to note that the strategies for an economy with multiple equilibria are significantly different from those for a standard competitive economy. If the eventual outcome is determined by forward-looking expectations, then the task of the development policy is to create convergent expectations around a desired equilibrium (Krugman, 1991, p.654). If the economic agents are backward-looking and the eventual outcome is determined by the initial conditions (that is, history), then in order to pull the economy away from an undesired equilibrium we must adopt a "*big push*" strategy, that is, we must move the initial conditions from the "*domain of attraction*" of the undesired equilibrium to that of the desired equilibrium in a sufficiently short period of time.

Transaction Cost, Market Size Effect and Multiple Equilibria

In statistics, there is a well-known *large sample property*: the quality of an estimator increases with the increase of the sample size (that is, *large is beautiful*). It is interesting to note that, in a vertically disintegrated industry, there are two large sample properties: the degree of specialization is increased (and hence the productivity is increased too) and the transaction cost is decreased when the industry's size is increased. In other words, the transaction cost shares a large sample property with the external economies. Therefore, along the line of reasoning regarding the external economies, it might be possible to establish that the large sample property of the transaction cost also leads to the market size effect as well as the multiple-equilibria property.

3. Empirical Analysis of the Performance of SMEs

The purpose of this section is to empirically analyze the performance of SMEs. Section 3.1 begins with studying the entry barrier for the footwear, keyboard, and personal computer industries. The rest of this section utilizes Chinese Taipei's census data, financial data collected from Chinese Taipei's central bank, and so on, to study the market shares of SMEs (which are a measure of the significance of the SMEs), the level of the MES, the job creation of the SMEs, and the performance of the SMEs in the Asian financial crisis.

3.1 Entry Barrier

Because Chinese Taipei's economy is shown to be vertically disintegrated, according to the theory of Section 2, Chinese Taipei's industries should have lower entry barriers. The following examines evidence of this in the footwear, keyboard, personal computer, and semiconductor industries.

Table 1 Footwear Exports of Korea and Chinese Taipei, 1969-1986

Unit: US$ million

	Korea			Chinese Taipei		
	Total	Number	Average	Total	Number	Average

	export value	of firms	Export value per firm	Export Value	of firms	export value per firm
1971	50	9	5.6	69	178	0.4
1975	200	16	12.5	258	305	0.8
1980	904	25	36.1	1,411	582	2.4
1985	1,571	68	23.1	2,301	1,140	2.0

Source: Levy (1991).

The decision of Mitsubishi, the leading Japanese trading company dealing in footwear, to relocate the production for export to the USA market from Japan to Chinese Taipei and Korea sparked the take-off of their footwear export industries. There were export surges in both Chinese Taipei and Korea after this take-off. However, these two economies have different growth patterns. As shown in Table 1, in Chinese Taipei, the export surge was accompanied by entry of many new firms, while in Korea, the export surge was for the most part accompanied by an expansion in the size of the existing operations (Levy, 1991, p.155, p.159). It seems that it was much easier for SMEs to enter the market in Chinese Taipei, and hence we can say Chinese Taipei's entry barrier was much lower than Korea's.

Similarly, in case studies of Chinese Taipei's keyboard and personal computer assembly industries, Levy and Kuo (1991, p.365) note that the presence of Chinese Taipei's independent traders willing and able to explore the prospects for export of the products of nascent small and medium-sized firms is one reason why Chinese Taipei's entrepreneurs could initiate production on a relatively small scale with little up-front investment. By contrast, the absence of indigenous traders with an incentive to explore export market potential for small firms is one reason why the initial investment costs for Korean firms are likely to be substantially larger.

Kawakami (1996) studied Chinese Taipei's personal computer industry by interviewing 17 manufacturers and two informants. Kawakami first notes that "Taiwan's personal computer industry (hereafter abbreviated as the PC industry) has attained an amazing record of expansion since the mid-1980s. … As Taiwan was primarily exporting simple labor-intensive products such as textiles and plastic products until the mid-1980s, this outstanding achievement in the PC industry is often referred to as a successful case of the upgrading of the industrial structure in a developing economy (p.1)." Kawakami then argues that it was the vigorous market entry activity of local SMEs that brought the rapid expansion of Chinese Taipei's PC industry (p.17); and the production subcontracting network relieved small manufacturers of fixed costs, and thus made their "bee-like" swarming market entries possible (p.29).[22]

[22] Levy and Kuo (1991) compare Korean keyboard and personal computer industries with Chinese Taipei's, and have a similar argument for the production network (p.365).

3.2 SME Shares and the Level of MES

The theory of Section 2 predicts that vertical disintegration can increase the share of SMEs and downsize the MES. This subsection aims at utilizing the comprehensive census data of Chinese Taipei to analyze the SME share and the level of the MES. The level of MES is tested by several methods using industry-wide as well as firm-level data.

Table 2 reports the time trends of SME shares of value added data.[23] There seems to have been more than one change in the pattern of productive activity distributed in firms of different sizes and categories since 1971. The first one happened in 1986. Before then, all three smaller-sized categories of firms (within our definition of SMEs) were efficient. This conclusion is based on the fact that firms in each of these categories were increasing their share of value added. After 1986, firms hiring ten to forty-nine persons were still increasing their share, while smaller firms (employing fewer than ten persons) adjusted to a new rising phase. At the same time, however, larger firms (with 50 to 499 employees) were sliding into a downturn, and firms with more than 500 employees were experiencing a loss of share – a signal of their inefficiency, or what is normally known as diseconomies of scale.

The situation did not change until 1991. This is probably the second time when there was a change in the structure of these firms' size distribution during our sample period. Although 1 to 9 employees' size is still an efficient scale, 10 to 49 employees' size has changed into an inefficient one. Larger firms (more than 500 employees) seem to have picked up the pieces left by smaller firms, gradually becoming an efficient production unit.

Looking at the results gathered from the 3-digit manufacturing industries sample, it is interesting to note that for most traditional, labor-intensive, low-tech manufacturing industries, larger firms (hiring 500 or more employees) were experiencing diseconomies of scale throughout the sample period. These industries include textile mill, accessories and leather, wood, bamboo and rattan products, and paper products and printing manufacturing industries. Since 1986, in almost every 3-digit manufacturing industry, even the smaller large firms (with 100 to 499 persons) were losing their share. The one and only exception is in the chemical, petroleum, coal, rubber and plastic products manufacturing industry, which is normally considered as to enjoy large-scale economies.

The manufacturing industry contains hundreds and thousands of firms producing a wide range of heterogeneous products, each with a different technological requirement. The results shown above depict only a general picture of the scale efficiency possessed by SMEs. To find out more precise information about the optimal production scale of a particular product, we need to consult more detailed classified industry data. Here we take six 4-digit industries for examples, to lower the heterogeneity of our sample.

[23] Value of production is another measure of a firm's economic activity. Appendix C reports the time trends of SME shares of the total value of production (a measure of output). However, it should be noted that value added is more appropriate than value of production.

Table 2 Value Added Shares of Manufacturing Firms in Chinese Taipei, 1971-1996

Unit:%

Employment Size (persons)	1~9	10~49	50~99	100~499	500and More
Whole Manufacturing					
1971	6.03	9.85	5.71	20.52	57.89
1976	7.68	12.54	8.03	27.85	43.91
1981	7.94	13.52	9.41	26.40	42.73
1986	7.37	17.13	10.51	26.73	38.26
1991	9.85	20.89	10.22	21.74	37.30
1996	10.96	20.64	9.75	19.63	39.02
Food, Beverages & Tobacco Manufacturing					
1971	16.22	5.65	1.05	1.69	75.38
1976	10.41	6.67	4.95	24.58	53.40
1981	9.65	8.38	5.85	25.74	50.38
1986	8.20	9.30	7.97	26.92	47.61
1991	6.71	8.91	6.64	29.12	48.62
1996	5.55	8.83	7.30	20.36	57.97
Textile Mill, Accessories & Leather Manufacturing					
1971	1.84	7.73	6.29	37.48	46.66
1976	2.93	8.31	7.84	38.04	42.89
1981	3.32	11.51	9.74	34.29	41.14
1986	3.95	14.67	12.25	38.03	31.10
1991	6.67	21.04	12.89	32.73	26.67
1996	9.22	23.82	14.21	31.05	21.69
Wood, Bamboo & Rattan Products Manufacturing					
1971	10.90	12.64	5.71	14.81	55.94
1976	17.94	22.82	11.02	23.51	24.71
1981	21.05	23.22	11.50	22.81	21.41
1986	17.16	26.87	14.05	27.50	14.44
1991	25.73	37.52	14.14	18.76	3.85
1996	33.58	39.06	12.95	13.33	1.08
Paper, Paper Products & Printing Manufacturing					
1971	8.65	18.26	6.57	24.09	42.44
1976	14.72	22.15	8.99	20.50	33.65
1981	16.64	18.35	11.50	21.79	31.72
1986	17.02	25.35	8.71	20.49	28.43
1991	23.36	27.06	7.01	15.81	26.75
1996	26.72	28.88	7.86	14.14	22.40
Chemical, Petroleum, Coal, Rubber & Plastic Products Manufacturing					
1971	2.25	5.39	5.20	20.59	66.58
1976	3.92	10.55	6.83	29.34	49.36
1981	4.27	12.15	8.56	29.03	46.00
1986	3.37	11.56	7.83	24.46	52.79
1991	5.63	15.77	8.76	17.37	52.47
1996	7.22	16.76	9.16	19.48	47.38
Non-Metallic Mineral Products Manufacturing					
1971	5.71	19.86	9.07	20.65	44.71
1976	6.40	18.27	10.14	25.68	39.51
1981	5.48	16.44	12.29	25.00	38.79
1986	5.09	22.94	16.85	24.10	31.03
1991	4.89	22.89	13.01	26.83	32.38
1996	5.99	21.70	9.76	23.08	39.47
Basic Metal Manufacturing					
1971	3.36	20.70	1.53	-1.29	75.70
1976	3.25	15.16	10.13	31.20	40.27
1981	3.54	15.04	13.43	26.41	41.58
1986	3.93	17.81	10.78	20.49	46.98
1991	5.22	18.23	10.35	21.63	44.57
1996	6.58	21.28	10.87	18.83	42.44
Fabricated Metal Products, Machinery & Equipment Manufacturing					
1971	6.83	12.91	6.64	18.18	55.44
1976	9.85	13.46	7.68	19.80	49.18
1981	10.56	13.61	8.49	20.50	46.84
1986	10.93	20.84	10.48	24.01	33.75
1991	12.54	23.42	10.18	19.62	34.25
1996	12.22	21.22	9.18	17.88	39.50
Other Industrial Products Manufacturing					
1971	5.88	11.59	11.06	31.01	40.45
1976	8.80	14.49	13.59	35.71	27.42
1981	9.79	20.96	13.32	36.84	19.10
1986	8.66	25.74	18.44	32.75	14.41
1991	13.97	35.46	16.17	22.76	11.64
1996	18.61	34.42	15.29	22.97	8.72

Source: *Industrial and Commercial Census* (in Chinese), 1971~1996.

Based on the philosophy that existing firms center around the efficient firm size, the 'proxy' MES approach was introduced back in the 1960s. Table 3 highlights the estimated proxy MES. Mid-point MES[24] remained approximately in the less than 100 employees' scale. The top 50% MES[25] appeared at a higher size level, in the 100 to 499 employees' scale. In spite of the differences, the time trends of the proxy MES are similar using different proxy formulas. In four out of six sample industries, there are scale-down trends in proxy MES. They are printing, dyeing and finishing, plywood manufacturing, other paper products, and stationery articles industries.

Table 3 The Estimated Proxy MES in Chinese Taipei, 1976-1996 Unit:persons

	Mid-point MES					Top 50 MES				
Industry	1976	1981	1986	1991	1996	1976	1981	1986	1991	1996
Grain Milling	103	48	57	46	56	350	103	216	108	124
Printing, Dyeing Finishing	90	122	176	83	79	344	194	212	185	138
Plywood Manufacturing	393	488	158	92	58	1083	953	374	191	115
Other Paper Products	135	55	70	50	45	187	99	176	106	80
Rubber Footwear	554	450	43	84	68	792	813	131	295	251
Stationery Articles	268	156	75	64	50	305	308	163	136	112

Source: *Industrial and Commercial Census* (in Chinese), 1976-1996.

To sum up, our empirical study confirms that there is a 'scaling down' of optimal scale in the manufacturing sector.[26] The smallest firms can no longer be treated as an inferior production sector, one that belongs only to the 'cottage industry'. In Chinese Taipei, modernized firms with less than ten employees have actually been improving their performance recently. Indeed, more and more attention will be focusing on knowledge- and/or technology-intensive production, and in such cases smallness of scale may prove to be a positive attribute. A more dynamic view about scale efficiency will be more helpful in interpreting the future evolution of the SME sector (Mazzucato, 1998).

3.3 Job Creation

In Chinese Taipei, there is widespread belief that SMEs play an important role in generating new jobs. The conventional beliefs may not be consistent with some of the extensive academic literature on this topic (Davis, et al. 1993).[27] In this subsection, we provide empirical evidences of Chinese Taipei's manufacturing sector to address such issue.

[24] Add up the market share of sale (or employment) in a descendant manner according to firm size up to 50% of the total sale. The firm completing the accumulation is the 'mid-point firm'. Its size is the mid-point MES proxy (Weiss, 1963).

[25] The average size of firms larger or equal to the 'mid-point firm' is the 'top-50% proxy MES' (Comanor and Wilson, 1967).

[26] For other empirical results, please consult Appendix D.

[27] Davis, et al. (1993) analyses the data of the U.S. manufacturing sector during the period 1972 to 1988 and claims the job-creating prowess of small business as erroneous on data interpretations.

Our analysis of job creation and destruction behavior in the manufacturing sector is based on the longitudinal data manipulated from the Chinese Taipei Industrial and Commercial Census, 1981-1996. A job is defined as an employment position filled by a worker (Davis, et al. 1993). Our data does not distinguish among part-time, full-time and overtime employment positions. The calculations of job creation and destruction rely on the firm-level base. We exclude using the concept of plant-level, a physical location where the production takes place, in order to avoid the problems of merging data between census years. Since the census survey was only conducted in 1981, 1986, 1991 and 1996, the exiting, entry and staying firms are measured between the census years. If, for example, a firm was present in the 1981 census data but absent from the 1986 census data, then the firm is treated as an exiting firm over the period 1981-1986. By the same token, a firm established during this same period is treated as an entrant. Thus, the aggregate employment of entry and exiting firms corresponds to the gross job creation and destruction, respectively.

Table 4 Job Creation and Destruction of Manufacturing Firms in Chinese Taipei, 1981-1996

Unit:Persons

	1981-1986			1986-1991			1991-1996		
Employment Size	**Exiting**	**Entry**	**Staying**	**Exiting**	**Entry**	**Staying**	**Exiting**	**Entry**	**Staying**
1-9	124,421	194,198	118,610	143,395	241,276	168,710	138,688	196,361	265,783
	18.59%	15.03%	8.31%	16.40%	25.05%	10.18%	27.13%	30.74%	14.12%
10-49	162,472	386,146	250,552	239,672	378,381	380,714	173,867	225,682	483,643
	24.27%	29.88%	17.56%	27.42%	39.28%	22.97%	34.01%	35.33%	25.69%
50-99	88,307	185,755	176,901	124,951	120,457	209,370	59,233	67,465	229,219
	13.19%	14.38%	12.39%	14.29%	12.51%	12.63%	11.59%	10.56%	12.18%
100-499	186,685	304,276	459,193	251,688	135,115	424,938	97,854	77,658	395,488
	27.89%	23.55%	32.17%	28.79%	14.03%	25.64%	19.14%	12.16%	21.01%
500+	107,487	221,755	421,981	114,459	88,033	473,512	41,596	71,574	508,493
	16.06%	17.16%	29.57%	13.09%	9.14%	28.57%	8.14%	11.21%	27.01%
Total	669,372	1,292,130	1,427,237	874,165	963,262	1,657,244	511,238	638,740	1,882,626
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: *Industrial and Commercial Census* (in Chinese)1981, 1986, 1991, and 1996.

Table 4 displays gross job creation and destruction by employment size of manufacturing firms in Chinese Taipei over the three inter-census periods of 1981-1996. The table shows a strong relationship between employment size and job creation. During 1981-1986, a total of 59% of gross job creation was contributed by firms with less than 100 employees. That ratio increased to about 76% during both the 1986-1991 and 1991-1996 periods. In contrast, firms with more than 500 employees account for only 11.2% of gross job creation. Overall, the empirical evidence clearly indicates that SMEs play a leading role in creating jobs for the Chinese Taipei economy.[28]

[28] To further stress the issue, Appendix E utilizes the Galton-Markov growth process proposed by Hart and Oulton (1996) to test Gibrat's proportionate growth model, which argues that firm growth is independent of firm size and there is no tendency for small firms to grow more quickly than large firms do.

3.4 New Evidence during the Crisis

Financial data from Chinese Taipei's central bank reveal that SMEs performed remarkably well during the crisis.[29] For example, as Table 5 shows, in 1997 the strong growth in average asset value of firms with fewer than 100 employees was greatly surpassed by the asset-value growth of their larger counterparts with more than 100 employees. But in 1998, while the larger firms experienced a sharp fall in their asset-value growth, the SMEs recorded a growth rate almost unchanged from the previous year. A similar pattern appeared in the figures for average net value and deposits of manufacturing firms. Among the different firm-size groups, those with 100 to 499 employees exhibited the weakest financial performance in 1998, while those with no more than nine employees appeared to be least affected by the crisis. Such findings furnish clear empirical evidence of the key balancing role that SMEs can play in a growing economy like Chinese Taipei.

One reason why SMEs were able to weather the financial crisis so well might be their well-known and oft-cited "flexibility". SMEs have often been categorized as production units that are quick to respond to outside change. This specialty is what we generally call "flexibility". Van Dijk (1995) defines "flexibility" in an industrial context as "*the ability to shift promptly from one process and/or product configuration to another and to adjust quantities of output rapidly up or down over the short run*" (p.21). The ability to make swift adjustments to quantities of output has often been examined by observing the variance of firms' sales. Empirical works provide confirmation that in the U.S., small firms exhibit more versatility in sales than do their larger counterparts (Mills and Schumann, 1985; Das, Chappell and Shughart, 1993).

It is shown that a vertically disintegrated industrial organization has a higher entry rate. This can also be seen as a symbol of flexibility. Of the 104,000 enterprises newly established in Chinese Taipei in 1998, 99.36 percent were SMEs. Also, in Chinese Taipei the changes in number of enterprises within different firm-size groups were found decreasing with the average group sizes (Hu, 1999). This means the smaller a firm's size, the more likely it is to change its decision about entry or exit.[30]

[29] In Appendix F, we utilize the market and employment shares of SMEs to discuss the performance of SMEs in the crisis.

[30] Another possible source of flexibility is exhibited in a firm's ability to rapidly change its factor intensity when the relative factor price is changing. In Appendix G, we analyze the flexibility of SMEs from this viewpoint.

Table 5 Financial Data of Manufacturing Firms in Chinese Taipei, 1996-1998

Unit: NT$1000

Employment Size	1996	1997	Growth	1998	Growth
	Assets				
1-9	24320	31226	28.40%	40501	29.70%
10-49	65228	71473	9.57%	74455	4.17%
50-99	184521	210823	14.25%	240985	14.31%
100-499	1548663	2122479	37.05%	2101254	-1.00%
500+	11199261	14222535	27.00%	15944980	12.11%
	Liabilities				
1-9	15194	20811	36.97%	28234	35.67%
10-49	44837	49344	10.05%	51456	4.28%
50-99	129977	143369	10.30%	158641	10.65%
100-499	822321	1077996	31.09%	1083661	0.53%
500+	4960447	6118314	23.34%	6934901	13.35%
	Net				
1-9	9125	10414	14.13%	12267	17.79%
10-49	20391	22129	8.52%	22999	3.93%
50-99	54544	67453	23.67%	82344	22.08%
100-499	726341	1044483	43.80%	1017593	-2.57%
500+	6238813	8104221	29.90%	9010078	11.18%
	Deposits				
1-9	1921	2094	9.01%	2544	21.49%
10-49	4467	4626	3.56%	5291	14.38%
50-99	11420	13208	15.66%	14239	7.81%
100-499	121583	198890	63.58%	201981	1.55%
500+	922023	1335857	44.88%	1523444	14.04%
	Debts				
1-9	9284	11976	29.00%	15536	29.73%
10-49	24748	27218	9.98%	29110	6.95%
50-99	69281	75678	9.23%	81508	7.70%
100-499	384126	534222	39.07%	585016	9.51%
500+	1848408	2354380	27.37%	2626653	11.56%

Note: Of the total of 1,053 manufacturing firms included in the survey, 136 firms were in the 1-9 employees group, 521 in the 10-49 group, 166 in the 50-99 group, 152 in the 100-499 group, and 78 in the 500+ group.

Source: *Annual Financial Survey of Public and Private Enterprises* (in Chinese), 1996-1998.

4. Is Vertical Disintegration Transferable?

Vertical disintegration is shown to be an important factor in the outstanding performances of both Silicon Valley and Chinese Taipei. Therefore, it is an important issue whether the experience of vertical disintegration is transferable to other economies. This section will

address this important question.[31] Section 4.1 applies the theory developed in Section 2.4 to analyze the issue in the context of a closed economy, and establishes that it is not easy to transfer vertical disintegration in this context. However, Section 4.2 shows that an *open trade policy* might help make the experience transferable.

4.1 The Case of Closed Economies

Recall that, in the theoretical analysis of Section 2, it was shown that (1) if an industry is developed in a vertically disintegrated manner then it incurs the transaction costs, and the scale economies realized by this industry are the Marshallian external economies; (2) due to the Marshallian external economies and the transaction costs, there is a market size effect and there are multiple equilibria.

The market size effect implies that it is not appropriate to develop an industry in the vertically disintegrated manner if the size of a closed economy is not large enough. That is, the experience of vertical disintegration is *potentially transferable* only to sufficiently large economies.

The theory of multiple equilibria implies that it depends upon the type of expectations whether the experience of vertical disintegration is *actually transferable* to those economies with sufficiently large sizes.

Recall that if the economic agents are backward-looking then "history" matters, for example, if an economy initially locates in the domain of attraction of the vertical integration equilibrium then it will get trapped into this equilibrium. One intuitive reason runs as follows. If initially the industrial organization is vertically integrated then there is a *vicious cycle*: any new entrant might be forced to enter the market as a vertically integrated enterprise, further forcing later new entrants to enter the market in a similar manner. In short, if the economic agents are backward-looking then it might not be easy to transfer the experience of vertical disintegration.

In this case, the big push strategy might be needed, at least for a closed economy, to push the economy into the domain of attraction of the vertical disintegration equilibrium. For example, if there is a sufficiently large number of enterprises simultaneously entering the market in a vertically disintegrated manner in a short period of time then there will be a dense network of product suppliers and service providers, which, in turn, will break the vicious cycle and generate a *virtuous cycle*. The network makes it possible for new potential entrants to enter the market vertically disintegratedly, and these new entrants themselves will further make the production/service network become more dense.

Next we will consider the case where the economic agents have forward-looking expectations. In this case, the vertical disintegration can be realized if somebody (for example, the government) is able to somehow form convergent expectations around the vertical disintegration equilibrium. For example, if all of the economic agents are convinced by the government's policy campaign to believe that each economic agent will enter the market vertically disintegratedly then the economy will actually end up in the vertical disintegration equilibrium. In this forward-looking case, the transferability of the

[31] This transferability issue is closely related to the following question: What is the origin of the vertical disintegration? Appendix H studies the origins of Chinese Taipei's vertical disintegration.

vertical disintegration depends upon whether the government has enough *credibility* to convince the economic agents.

In short, the two unusual properties (namely, the market size effect and the multiple equilibria) make the experience of vertical disintegration transferable to a closed economy which initially has a vertically integrated industrial organization only under some conditions (namely, if the size of the closed economy is large enough, the economic agents have forward-looking expectations, and somebody [e.g., the government] is able to form convergent expectations around the vertical disintegration equilibrium).

Mutual Complementarity, Invisible Personal Networks and the Venture Capital Industry

It is useful to utilize the concept of *mutual complementarity* to explain the non-transferability of vertical disintegration. Let us use the venture capital industry as an example to explain this concept. Gompers (1999) has already noted that the dramatic success of the U.S. venture model has not been transferred internationally. Outside the U.S., substantially smaller amounts of venture funding flow into the hands of young entrepreneurs. It should be noted that there is mutual complementarity between the venture capital industry and the SMEs. On the one hand, it is well known that the industry helps the formatting of the SME sector. On the other hand, the presence of SMEs is also crucial for the venture capital industry to survive since vertically integrated large enterprises by definition need not purchase outside "services" and hence the venture capital industry must rely upon the SMEs to survive. Therefore, it is not easy to develop the venture capital industry in an economy with a vertically integrated industrial organization. This explains why the venture capital industry performs much better in Silicon Valley than in Route 128.

As shown in Table 6, Chinese Taipei's venture capital industry has had an impressive growth pattern since it was founded in 1984.[32] The theory of mutual complementarity can also explain why Chinese Taipei's venture capital industry has been able to prosper. In studying venture capital industry, Schive (1999, p.12) notes that "By nature, SMEs will receive the lion's share of venture capital funds, because existing, well-established large companies are able to collect capital in the capital market and through regular bank loan options." This explains why Chinese Taipei's venture capital industry has an impressive growth pattern since Chinese Taipei has many SMEs and hence there is an abundance of potential consumers for the venture capital industry.

[32] For an introduction to Chinese Taipei's venture capital industry, please refer to Schive (1999).

Table 6 Growth of Venture Capital Industry in Chinese Taipei, 1984-1999

Year	1984	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
No. of Firms	1	7	2	2	3	1	6	14	28	38	45
Cumulated No. of Firms	1	20	22	24	27	28	34	47	72	107	153
Capital Collected (NT$ billion)	0.2	3.65	1.64	1.20	1.80	1.13	4.01	6.76	17.17	30.30	30.49
Cumulated Capital Collected (NT$ billion)	0.2	8.92	10.56	11.76	13.56	14.70	18.70	25.46	42.63	72.93	103.43

Source: Taiwan Venture Capital Association, *1999 Venture Capital Industry Annual Survey*, May 2000.

In general, there are mutual complementarities between different stages of a vertically disintegrated industry. One important policy implication is that a single stage cannot be developed without the supports of other stages, i.e., all stages of an industry must be developed simultaneously.

Furthermore, it is shown in Section 2.3 that for the venture capital industry to perform well, effective networks of personal relationship are required to solve the opportunism problem and to solve it quickly. Therefore, the complementarity of networks of personal relationships to the venture capital industry also explains its non-transferability.

4.2 The Case of Open Economies

It is shown that the experience of vertical disintegration is transferable to a closed economy only under some conditions, and the closed economy might get trapped into a vicious cycle if it initially locates in the domain of attraction of vertical integration equilibrium. Fortunately, *globalization* of the world economy may help break the vicious cycle. This is because the globalization might make it unnecessary to develop all of the stages of a targeted industry simultaneously, an extremely demanding mission. For example, one economy may first choose to specialize in a specific stage of a targeted industry and rely upon the other stages of the other economies as either suppliers or consumers to survive; then proceed to develop other stages after this specific stage is developed successfully. In fact, this strategy has been, perhaps unintentionally, utilized by Chinese Taipei to develop various industries, e.g., the personal computer industry.

If we want to develop an industry in the vertically disintegrated manner then it is important to enlarge the size of the whole industry. One way is to follow the traditional doctrine of "comparative advantage", which argues that one economy should specialize in the industries where it has comparative advantage and abandon those without. This is because if we abandon some industries, then the remaining targeted industries could be larger.[33] It is worth noticing that the principle of comparative advantage argues for *labor division between regions* and the principle of vertical disintegration for *labor division*

[33] Another way to increase the size of an industry is letting the industry be geographically concentrated (Stigler, 1968, p.139). This provides a justification for the policy of establishing industrial parks.

between firms. Therefore, it is not surprising that these two principles can reinforce each other.[34]

As a result, the *open trade policy* helps the experience of vertical disintegration be transferable since it not only facilitates globalization but also is consistent with the principle of comparative advantage.

5. Conclusions and Implications

Section 1 shows that one outstanding feature of both Silicon Valley and Chinese Taipei is vertical disintegration. Subsequently, Section 2 develops a theoretical framework to evaluate the vertical disintegration and hence explains the outstanding performances of both Silicon Valley and Chinese Taipei. Section 2.1 demonstrates that, from a static viewpoint, one advantage of vertical disintegration is that the agency cost is relatively insignificant since vertical disintegration reduces the optimal firm size. However, one of its potential disadvantages is that it may cause transaction costs since vertical disintegration replaces internal management of firms by market transactions. Transaction costs are essentially determined by whether the transactions involve asset specificity, which causes bilateral monopoly as well as opportunism. Thus, the above disadvantage can be overcome if the size of the whole industry is large enough since there are then many buyers and sellers for any good and, by definition, asset specificity vanishes in this case.

Section 2.2 shows that, from an evolutionary viewpoint, one advantage of vertical disintegration is it lowers the entry barrier since it allows start-ups to focus on one specific area of expertise, without the burden of manufacturing every part of a product. A low entry barrier has at least two important implications. First of all, it is easier for the SMEs to enter the market. Therefore, a vertically disintegrated industrial organization allows the SMEs to perform effectively, and hence injects fierce competition into the whole economy. Secondly, it is easier to develop a new product/service. Thus, a vertically disintegrated industrial organization has a faster pace of new product/service introductions.

Because it is often noted that personal relationships play an important role in doing business in both Silicon Valley and Chinese Taipei, Section 2.3 aims to explain and evaluate the personal relationships. As mentioned, the problem of opportunism is an important concern if the transactions involve asset specificity. Section 2.3 demonstrates that personal relationships are important measure to combat the problem of opportunism since an economic agent can utilize personal networks to *ex ante* check the reputations of its potential partners and to *ex post* discipline its partners if its partners play opportunism against it. This theory explains why personal relationships are highly valued in vertically disintegrated economies such as Silicon Valley and Chinese Taipei. This theory also

[34] It is also interesting to note that the vertical disintegration can be utilized to establish that localization is consistent with globalization. If an industry is vertically disintegrated then, as mentioned, there is labor division between firms. Therefore localization and globalization may occur simultaneously since a firm may conduct labor division with both firms of the same region and those of different regions. Silicon Valley is a case in point. Stigler (1968, p.139) refers to the policy of letting an industry be geographically concentrated as "localization". One explanation for this terminology is the policy helps the firms of the same region realize the labor division between themselves.

suggests that personal relationships help develop new industries since the infant stage of an industry usually has a high degree of asset specificity.

Moreover, the framework developed by Section 2.3 is applied to analyze the venture capital industry, which plays an essential role in helping start-ups with new ideas. It is shown that the personal network is a complement to the venture capital industry.

A vertically disintegrated industry accomplishes scale economies via *Marshallian external economies*. Section 2.4 shows that Marshallian external economies involve three unusual and important properties, and these properties have important policy implications. First of all, in an industry with external economies, a firm generates external benefit to other firms. Accordingly, in order to have an optimum industry size, such an industry should be subsidized. This is the so-called *Marshall's rule*. This theoretical finding provides a justification to subsidize the vertically disintegrated industry that is composed of many specialized small firms and realizes the scale economies by the specialization between firms. Second, in *a closed economy*, if the external economies are significant enough then the industry can survive only when the size of the closed economy is large enough. This is the so-called *market size effect.* Accordingly, it is not appropriate to develop an industry with significant external economies if the relevant economy is not large enough. Third and perhaps the most important, if the external economies are significant enough then there are two stable equilibria: one is the desired equilibrium where the industry with external economies survives and the other is an undesired equilibrium where the industry dies out. It is emphasized in the literature that a world with multiple equilibria is significantly different from the standard competitive world. In a world with multiple equilibria, either initial conditions or expectations are decisive in determining the eventual outcomes; i.e., either initial conditions or expectations are able to lead two economies to different long-run outcomes even though these two economies have the same tastes, technology, and factor endowments.

Section 3 empirically analyzes the performance of SMEs. Section 3.1 demonstrates that the entry barrier is low for footwear, keyboard, and personal computer industries. The rest of this section utilizes Chinese Taipei's census data and so on to empirically study the market shares of SMEs, which provide a measure of the SMEs' significance, and also the level of MES, job creation by the SMEs, and the performance of the SMEs in the Asian financial crisis. The findings of this section confirm the theoretical arguments of Section 2.

Vertical disintegration is shown to be an important factor for the outstanding performances of both Silicon Valley and Chinese Taipei. Therefore, it is an important issue whether the experience of vertical disintegration is transferable to other economies. Section 4 addresses this important issue. Section 4.1 applies the theory developed in Section 2.4 to analyze the problem in the context of a closed economy, and establishes that it is not easy to transfer vertical disintegration in this context. In other words, the experience of vertical disintegration is transferable to a closed economy only under some conditions, and the closed economy might get trapped into a vicious cycle if it initially locates in the domain of attraction of vertical integration equilibrium.

Fortunately, Section 4.2 demonstrates that *globalization* of the world economy may help break the vicious cycle. This is because the globalization might make it unnecessary to

develop all of the stages of a targeted industry simultaneously, an extremely difficult mission. For example, one economy may first choose to specialize in a specific stage of a targeted industry and rely upon the other stages of the other economies as either suppliers or consumers to survive; then proceed to develop other stages after this specific stage is developed successfully. Another strategy is to follow the traditional doctrine of "comparative advantage" since this strategy is able to enlarge the size of the whole industry. As a result, an open trade policy might help the experience of vertical disintegration be transferable.

Competitiveness of SMEs in the Past and beyond the Crisis

Our theory predicts that the competitiveness of SMEs depends essentially upon the degree of vertical disintegration. If the economy is vertically disintegrated, it is easier for SMEs to enter the market and perform competitively. One reason is that SMEs can rely upon the production network to obtain necessary resources, that is, vertical disintegration allows SMEs to be less resource demanding. Another reason is that large enterprises have less incentive to vertically foreclose SMEs, and even help the formation of SMEs (for example, as mentioned in footnote 2, TSMC, which is the world's leading pure IC foundry, helped the formation of IC design houses) if they are vertically disintegrated. Therefore, the high degree of vertical disintegration of Chinese Taipei explains the remarkable performance of its SMEs.

Recall that Marshallian external economies make the economy have two equilibria, and there is a virtuous cycle if the economy locates in the desired equilibrium, that is, there is a *positive feedback effect* once the economy reaches the desired equilibrium. Therefore, this theory predicts that SMEs might be able to perform competitively in the future as well.

Entrepreneurship

Entrepreneurship is the ability to mobilize resources in order to benefit from the new business opportunities. In this sense, entrepreneurship has been at the center of economic growth and employment ever since the industrial revolution in the eighteenth century. Moreover, the significance of entrepreneurship has increased as the economy has become more knowledge-based. Therefore, how to foster entrepreneurship is an important policy issue (see Individual Report I, "Growth Potentials of APEC Economies Beyond the Asian Crisis,"of this report).

Our theory suggests that the significance of entrepreneurship is positively related to the degree of vertical disintegration. One reason is that if the economy is vertically disintegrated then it is much easier for those with new ideas to enter the market.[35]

[35] A survey shows that, in terms of the significance of entrepreneurship among about fifty major economies in the world, Hong Kong, China; and Chinese Taipei ranked at the top (Japan's report). This survey confirms our theory. From the viewpoint of entrepreneurship, Hong Kong, China seems to be very similar to Chinese Taipei. For example, Wong (1998, p.24) also observes that "It (Hong Kong, China) is a place where many people are keen to be their own boss, where the supply of small factory and shop owners is more than abundant." Therefore, it might be worth trying to apply our theory to interpret the entrepreneurship of Hong Kong, China.

Corporate Governance

Lax corporate governance in Asia had contributed to over-investment, excessive conglomeration, and over-indebtedness, and thus was a major cause of the Asian crisis. Improving corporate governance should be seen as an ongoing structural reform commitment, which will produce long-term benefits (Summary Report on APEC Economic Committee Symposium–"The Future of Asia Pacific Economies", December 6-7, 1999, Tokyo, p.7). It is important to note that vertical disintegration works in favor of corporate governance. In essence, the main purpose of corporate governance is to reduce agency cost (Jensen, 1993). As we discussed earlier, one virtue of vertical disintegration is that is reduces agency cost since it downsizes the optimal firm size, and hence automatically reduces the agency cost.

Policy Implication for the SME Sector

It is recognized that" the build-up of structural weakness, which had been masked by the impressive record of growth, was an important underlying factor for the [Asian financial] crisis." Therefore, it is important to address how to achieve an ideal economic structure. Our results imply that an ideal economic structure is one in which both agency and transaction costs are relatively low. In particular, from the viewpoint of SMEs, the ideal economic structure is one where both the MES and entry barriers are relatively low. Our results indicate that these desirable characteristics can be attained if the industrial structure is vertically disintegrated and the size of the whole industry is large enough.

Ministers with responsibility for SMEs and businesses from around the APEC region met in Christchurch, New Zealand in April 1999 and noted that SMEs are looking for a competitive low-cost environment that allows them to perform efficiently and effectively. Our results show that in order to allow SMEs to perform competitively, it is more important to keep both the MES and entry barriers at sufficiently low levels than to directly subsidize them, and that the MES is relatively small in a vertically disintegrated industry. Hence SMEs are less capital demanding in a vertically disintegrated industry and it is easier for them to deal with a credit crunch such as that caused by the Asian financial crisis.

Chinese Taipei has established 49 industrial parks and districts, which provide infrastructure facilities, enable new investors to rent rather than buy land and buildings, and provide generous loans. In such areas, the technical skills of scientifically trained people are accepted as an important part (up to 50 percent) of their personal investment (Scitovsky, 1990, p.136). In other words, the industrial-park policy decreases the MES for new investors, and hence lowers the entry level.

Competition policy plays a significant role in lowering the level of entry barriers, as noted by Amsden and Singh (1994, p.941).[36] However, competition policy is often neglected in East Asia's economic development. For example, in their seminal analysis of industrial

[36] There is another reason why competition policy might be able to deal in general with the structural weakness problem. It is recognized that one cause of the Asian financial crisis was that some financial institutions had too much market power. One main purpose of competition policy is to decrease the market power of economic agents in order to prevent them from manipulating the markets.

organization in Japan, Caves and Uekusa (1976, p.157) concluded that inadequate anti-monopoly policy had placed significant costs on the Japanese economy in the form of allocative inefficiency and diversion of rivalry into costly non-priced forms. They questioned the role of creating recession cartels and entry barriers.

In the initial development phase of an industry, the size of the industry is typically small, and hence the transaction costs are likely to be high if the industry is vertically disintegrated. Therefore, it is a reasonable strategy to develop the industry in a vertically integrated fashion in the initial stage. However, this strategy may hamper further development as vertical integration raises entry barriers and hence hinders competition. In other words, a vertically integrated industrial organization has the structural weakness of hindering competition. Therefore, it is important to restructure such industries once they are large enough. Competition policy, again, could contribute to this process since it helps lower entry barriers for SMEs.

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APPENDIX A: EMPIRICAL EVIDENCE OF VERTICAL DISINTEGRATION IN CHINESE TAIPEI

Section 1 has already shown that vertical disintegration is one important feature of Chinese Taipei's economy. The core-satellite system is another form of vertical disintegration. Statistics about core-satellite relationships are available in Chinese Taipei (Schive, 1999). In 1993, there were 127 registered cases with 1,963 formally participating firms from 23 industries (Table A1). In 1998, there were 184 registered cases with 2,850 formally participating firms (though the number of firms actually involved was about 17,100, six times as many as those formally registered).

Table A1 Core-Satellite Industrial Groupings, 1993

Type of Industry	No. of groupings	No. of participating firms	Type of Industry	No. of groupings	No. of participating firms
Autos	16	523	Footwear	3	20
Motorbikes	4	88	Furniture	2	14
Bicycles	4	58	Umbrellas	1	11
Sewing machines	4	56	Metal processing	9	183
Machinery	19	203	Chemicals	6	90
			Toys	1	8
Electric machinery, cables, and home appliances; electronics; information	38	555	Food	4	38
			Ceramics	2	19
			Glass	1	10
			Textiles	9	59
Photography equipment	1	6	Aerospace	2	14
Sporting	1	8	Total	127	1,963

Source: Schive (1999), Table A3.

Statistics set out in Table A1 reveal only the importance of networking relationships in terms of frequency, measured by numbers of groups and participants. Newly published statistics provide further information about the proportion of final products originated from intermediate inputs provided by other firms (Table A2). By deciphering data from the input-output table, the genuine contribution of SMEs[37] as well as large enterprises (LEs) through the economy's subcontracting system can be established. In the SME sector, a high proportion of final-product output depends on intermediate inputs from other sources. In the supply of these intermediate inputs, SMEs play a more significant role than do their larger counterparts. In 1991, 52.35 percent of output value from SMEs in the industry sector depended on SMEs' inputs, while the share contributed by LEs stood at 37.21 percent. In 1996, the shares of both had fallen to 45.25 percent and 29.35 percent respectively.

In the LE sector, the dependency is less obvious, which also means that large firms are more vertically integrated than SMEs. However, between 1991 and 1996, LEs in the industry sector showed a substantial increase in dependency on other firms. In 1991, SMEs and LEs furnished 17.68 percent and 13.07 percent, respectively, of the output value of industrial LEs; in 1996, the figures had risen to 36.2 percent and 29.71 percent, respectively.

[37] Here, the upper bounds of SMEs are 200 employees for manufacturing and construction industries, and 50 persons for other industries.

Table A2 Intermediate Input Sources of SMEs and LEs, by Industries: 1991, 1996

Final goods Producers / Intermediate Input sources (%)		SMEs			Les		
		Agriculture[b]	Industry	Service	Agriculture[b]	Industry	Service
	1991						
SMEs	Agriculture[b]	29.94	2.42	0.05	0	1.21	0.03
	Industry	17.85	40.39	7.63	0	13.47	6.24
	Service	8.77	9.54	14.54	0	3.01	14.51
	Sum of SMEs (%)	***56.56***	***52.35***	***22.22***	***0***	***17.68***	***20.78***
LEs	Agriculture[b]	0.00	0.00	0.00	0	0.00	0.00
	Industry	12.22	31.54	7.23	0	11.27	5.94
	Service	7.36	5.67	10.88	0	1.80	12.00
	Sum of LEs (%)	***19.58***	***37.21***	***18.11***	***0***	***13.07***	***17.94***
	Total value of production (NT$ million)	391,100	3,565,870	2,744,380	0	2,677,395	1,354,420
	1996						
SMEs	Agriculture[b]	17.58	3.45	0.01	0	3.24	0.03
	Industry	14.29	31.57	6.31	0	24.96	5.31
	Service	6.38	10.23	12.40	0	8.00	11.10
	Sum of SMEs (%)	***36.25***	***45.25***	***18.72***	***0***	***36.20***	***16.44***
LEs	Agriculture[b]	0.00	0.00	0.00	0	0.00	0.00
	Industry	10.97	23.67	4.63	0	25.22	4.99
	Service	5.28	5.68	8.73	0	4.49	7.94
	Sum of Les (%)	***16.25***	***29.35***	***13.36***	***0***	***29.71***	***12.93***
	Total value of production (NT$ million)	517,929	4,862,951	3,763,813	0	3,999,010	3,203,566

Notes: a) The upper bounds of SMEs are 200 employees for manufacturing and construction industries, and 50 persons for other industries. SMEs and LEs denote small and medium–sized enterprises and large enterprises respectively.
b) All firms in the agriculture sector are assumed to be SMEs.
Source: Statistics were compiled by the authors from Wang and Wu (2000), pp. 5-38, Table 17.

There have been many anecdotal evidences of high vertical disintegration in the Chinese Taipei economy, as shown in the literature review of this study. We go a step further by analyzing census data to sketch a more comprehensive picture of vertical disintegration in Chinese Taipei and to prepare internationally comparable statistical analysis of it. The results are summarized in Table A3. In this study, the (value added)/(product value) ratio

is utilized to measure the degree of vertical integration. This measure is a standard one. However, it should be noted that this measure has a systematic bias, namely, the more upstream an industry is the higher this measure is, other things being equal. Therefore, this measure cannot be applied to conduct cross-industry comparison, though it can be utilized to conduct both inter-temporal and international comparison for the same industry. Table A3 demonstrates that there is no clear time trend in the degree of vertical integration of Chinese Taipei.

Table A3 Degrees of Vertical Integration of Manufacturing Firms in Chinese Taipei: 1981-1996

unit:%

Manufacturing \ year	1981	1986	1991	1996
Whole Manufacturing	35.97	38.45	41.21	40.55
Food, Beverages Manufacturing	34.14	44.78	39.95	44.42
Tobacco Manufacturing	74.46	71.33	79.56	79.71
Textile Mill Product Manufacturing	29.47	37.63	38.85	37.39
Wearing Apparel & Accessories Manufacturing	39.58	37.95	45.31	42.83
Leather & Fur Products Manufacturing	33.62	30.44	36.27	33.85
Wood & Bamboo Products Manufacturing	33.70	37.34	38.78	42.39
Furniture & Fixtures Manufacturing	38.94	33.54	38.16	40.19
Pulp, Paper & Paper Products Manufacturing	31.00	32.30	34.16	33.43
Printing Manufacturing	48.01	45.88	49.06	49.18
Chemical Matter Manufacturing	26.17	33.14	36.82	32.21
Chemical Products Manufacturing	34.34	35.72	38.32	36.63
Petroleum & Coal Products Manufacturing	12.03	44.83	49.40	46.09
Rubber Products Manufacturing	33.73	36.90	40.94	38.13
Plastic Products Manufacturing	31.17	33.37	36.98	37.25
Non-Metallic Mineral Products Manufacturing	39.10	45.23	52.94	45.15
Basic Metal Manufacturing	30.65	29.93	36.19	32.56
Fabricated Metal Products Manufacturing	25.08	38.99	40.85	47.57
Machinery & Equipment Manufacturing	36.98	36.58	37.80	40.26
Electrical & Electronic Machinery Manufacturing	37.56	33.04	34.46	36.02
Transport Equipment Manufacturing	35.13	34.09	38.14	37.55
Precision Instruments Manufacturing	42.31	36.37	37.83	42.63
Misc. Industrial Products Manufacturing	38.77	36.63	38.72	41.05

Source: *Industrial and Commercial Census* (in Chinese), 1981~1996.

APPENDIX B: MARSHALLIAN EXTERNAL ECONOMIES AND VERTICAL DISINTEGRATION

This appendix aims to show that a vertically disintegrated industry is also able to achieve scale economies via *Marshallian external economies*. *Accordingly, from the viewpoint of scale economies, it does not make a difference whether an industry is vertically integrated or not.*

A vertically integrated firm can accomplish scale economies by *specialization within the firm*. This type of scale economies is known as *internal economies* since it is internal to the firm. Nonetheless, a vertically disintegrated industry also can accomplish scale economies by *specialization between firms*, each of which specializes in a specific area of expertise. Robinson (1933, Appendix, Section 6, p.338) already notes that "We are tempted to conclude that increasing returns could then occur through the specialization of firms. Each firm may relieve the strain upon management by abandoning some processes of manufacture to other firms, and so be enabled to carry out the production which it retains upon a larger scale, making use of those indivisible units of the factors which were not fully occupied before. … The specialization of firms may be of two types, lateral disintegration and vertical disintegration." This kind of scale economies is known as the *Marshallian external economies*, which is external to the firm but internal to the industry. Robinson (1933, Appendix, Section 7, p.341) also refers to the external economies as either *the economy of specialization of firms* or *the economy of large-scale industry*.

Although the terms used now might seem to be novel, the concept itself is an old one. Marshall (1890) long before pointed out that "*the advantages of production at a large scale can be as well attained by the aggregation of a large number of small masters into the district as by the erection of a few large works*". This traditional concept of 'industrial districts' later was officially defined as 'productive systems characterized by a large number of firms that are involved at various stages and in various ways, in the production of a homogeneous product'.[38] Silicon Valley in the U.S. and the Hsinchu Science Park in Chinese Taipei can be spotlighted as two successful examples of modern 'industrial districts' that aim particularly at manufacturing high-technology products.

It is important to note that Robinson's aforecited line of reasoning implies that disintegration can reduce the optimal firm size.[39]

It depends upon the size of the whole industry, not the size of the firm, whether the external economies can be realized (Robinson, 1933, pp.340-341). Therefore, if the productivity of an industry increases with the increase of the industry's size, then the industry is defined as having Marshallian external economies. One general explanation of the external economies rests on the argument that "a larger industry takes better advantage of within-industry specialization (the division of labor is limited by the extent of the

[38] This definition was made in 1995 by the International Institute of Labor Studies in Geneva.

[39] Actually, Robinson (1933, Appendix, Section 7, p.342) has a similar argument: "It is easier, a priori, to think of reasons why the optimum firm should grow smaller as the result of external economies than of the reasons why it should grow larger."

market, and so probably is the division of other factors of production)…(Helpman, 1984, p.329).[40]

In trade theory, there is an extensive literature studying the Marshallian external economies. For an introduction, please refer to Chipman (1970) and Helpman (1984). Recently, external economies have also played an important role in the endogenous growth theory (Romer, 1986, Section II). Therefore, we can say that the external economies are of significance.

[40] For example, Robinson (1933, p.341) notes that "The simplest example of this type of external economies is the case where machinery can be bought more cheaply when the industry presents a larger market to the machinery-making industry. But this is properly to be regarded as an example of vertical disintegration." This explains why Adam Smith argued that vertical disintegration is the typical development in growing industries, and vertical integration in declining industries (Stigler, 1986, p.135).

APPENDIX C: SME SHARES OF TOTAL VALUE OF PRODUCTION IN CHINESE TAIPEI

Table A4 reports the time trends of SME shares of the total value of production (a measure of output), and also provides information about the changes in the industrial structure in Chinese Taipei. Before the 1960s, the economy was full of SMEs. However, when the pace of industrialization accelerated after the mid-1960s, the larger firms began to play a major role. It was only in the mid-1970s and after that SMEs in Chinese Taipei came to enjoy their golden period. In 1971, those SMEs produced 37.09% of the economy's total output. That share subsequently slipped to a low of 32.27% in 1976, and then bounced back into an upward trend that brought it to 45.41% in 1996. According to the 'survival technique', those firms that lost their shares were inefficient (Stigler, 1958), and SMEs did not meet scale efficiency until the mid-1970s. However, judging from the increasing trend of their output share, since 1976, SMEs were an efficient sector in the economy. In fact, the reversing trend of the SME share shown here seems recently to have become a worldwide phenomenon (Storey, 1982; Acs, 1992; Hu and Schive, 1998).

Table A4 Shares of Total Value of Production in Chinese Taipei, 1971-1996

Unit: %

	SMEs (1-99 persons) Shares					Weight of Industry				
	1971	1976	1986	1991	1996	1971	1976	1986	1991	1996
Mining & Quarrying	5.88	20.95	32.83	55.37	75.43	0.06	0.67	0.37	0.27	0.16
Manufacturing	26.72	27.32	33.83	37.67	37.86	47.48	71.61	69.36	60.10	52.77
Electricity, Gas & Water	3.16	0.83	1.17	1.24	1.63	1.79	2.70	3.10	2.62	2.24
Construction	51.19	38.51	46.56	53.80	76.16	2.74	4.68	4.04	6.40	7.23
Industry Sub-total	26.96	27.02	33.17	37.86	41.10	52.60	79.66	76.87	69.39	62.40
Commerce	49.10	88.48	84.94	83.57	84.07	37.15	7.28	7.81	9.83	12.46
Transport, Storage & Communications	– –	26.42	27.67	29.29	29.03	– –	6.48	5.96	6.10	5.90
Finance, Insurance, Real Estate & Business Service	– –	39.31	28.64	33.78	33.21	– –	6.57	9.37	14.68	14.36
Others	45.60	– –	– –	– –	57.57	10.24	– –	– –	– –	4.89
Service Sub-total	48.34	52.82	47.39	48.88	52.58	47.40	20.34	23.14	30.61	37.60
Total	37.09	32.27	36.46	41.23	45.41	100.00	100.00	100.00	100.00	100.00

Source: *Industrial and Commercial Census* (in Chinese), 1976, 1986, 1991, and 1996.

APPENDIX D: FURTHER EMPIRICAL ANALYSIS OF SCALE EFFICIENCY USING CRUDE COST DATA

Table A5 highlights information about the relative average cost. In grain milling, printing, dyeing and finishing, plywood, and other paper products manufacturing industries, the lowest average/accounting cost (AC) records basically appeared in the 50 to 499 employees groups. In the manufacturing of rubber footwear and stationery articles, the optimal scale jumped from the size group of 50-99 empersons to that of more than 500 persons. The somewhat ambiguous results might be due to the use of crude accounting cost data. Still, if we focus only on the scale of the firms with the lowest unit costs in each sample industry, we find that they all have fewer than one hundred employees. In a nutshell, for all the six sample industries, the best performing firms were all SMEs.

Table A5 Relative Average Cost of Manufacturing Firms in Chinese Taipei, 1976-1996

Employment Size (persons)	1~9	10~49	50~99	100~499	500 and More	The Size of Enterprise with the Lowest Cost
Grain Milling Manufacturing						
1976	1.10	0.87	0.40	0.40	0.66	1
1981	1.11	0.72	0.40	0.27	0.54	2
1986	1.14	0.64	0.35	0.46	0.95	3
1991	1.18	0.66	0.45	0.45	a	4
1996	1.28	0.56	0.62	0.64	a	56
Printing, Dyeing & Finishing Manufacturing						
1976	1.37	0.95	0.64	0.78	1.76	53
1981	0.23	0.18	0.20	6.68	a	5
1986	1.14	0.96	0.82	0.78	a	4
1991	0.97	0.81	0.69	2.98	0.77	9
1996	1.10	0.98	0.84	0.80	1.40	10
Plywood Manufacturing						
1976	1.08	0.97	0.94	0.93	1.41	14
1981	1.13	0.92	0.79	0.76	0.69	68
1986	1.19	0.91	0.94	0.67	0.80	2
1991	1.14	0.94	0.69	0.78	1.44	7
1996	1.14	0.91	0.65	0.56	a	24
Other Paper Products Manufacturing						
1976	1.16	0.82	0.85	0.54	a	4
1981	1.16	0.80	0.58	0.65	0.42	45
1986	1.12	0.88	0.76	0.90	a	9
1991	1.04	0.96	0.92	0.86	a	3
1996	1.13	0.87	0.87	0.86	a	33
Rubber Footwear Manufacturing						
1976	1.10	0.84	0.80	0.88	1.63	7
1981	1.12	1.02	0.70	0.76	0.86	48
1986	1.52	1.41	1.15	1.28	a	7
1991	1.13	0.91	0.76	0.74	0.52	5
1996	1.10	0.89	0.82	0.56	0.43	36
Stationery Articles Manufacturing						
1976	1.16	0.91	0.61	0.74	a	80
1981	1.22	0.56	0.93	0.61	0.31	2
1986	1.07	0.90	0.89	1.03	a	4
1991	1.40	0.44	0.56	0.48	0.41	12
1996	1.06	0.94	0.87	0.72	0.54	5

Note: a) No firm belongs to this category.
Source: *Industrial and Commercial Census* (in Chinese), 1971-1996.

Finally, we use the most sophisticated method: finding the transcendental logarithmic cost function of each sample 4-digit industry, and then computing each firm's elasticity of cost. Cost elasticity (CE) is a measure of the percentage change in total cost due to a change of output. To our surprise, all six sample industries were still experiencing decreasing average cost as the firm's scale increased in 1996 (Table A6). Which means all firms were too small to meet the scale efficiency. Firms in some industries that enjoyed scale efficiency once or twice in the past were all large firms (hiring more than 100 persons). The solitary exception was back in 1981, when firms with 50~499 employees were enjoying scale efficiency (CE = 1) in the stationery articles manufacturing industry. At some periods, the largest firms (with more than 500 employees) were losing their scale efficiency (CE > 1), but the chance was small.

Table A6 Estimated Cost Elasticity of Manufacturing Firms in Chinese Taipei, 1976-1996

Employment size (persons)	1~9	10~49	50~99	100~499	500 and Mor	Whole Industry	MES (CE=1)
Grain Milling Manufacturing							
1976	0.52*	0.67*	0.90*	1.01	1.08*	0.58*	138
1981	0.50*	0.68*	0.81*	0.87*	0.83*	0.61*	a
1986	0.50*	0.73*	0.92*	1.04	1.02*	0.57*	103
1991	0.53*	0.69*	0.73*	0.75*	b	0.61*	a
1996	0.50*	0.73*	0.80*	0.88*	b	0.60*	a
Printing, Dyeing & Finishing Manufacturing							
1976	0.61*	0.70*	0.79*	0.84*	0.92	0.71*	a
1981	0.51*	0.70*	0.83*	0.91	b	0.69*	380
1986	0.72*	0.75*	0.80*	0.83*	b	0.75*	a
1991	0.61*	0.69*	0.75*	0.80*	0.86*	0.68*	a
1996	0.73*	0.76*	0.77*	0.78*	0.80*	0.75*	a
Plywood Manufacturing							
1976	0.71*	0.74*	0.78*	0.85*	0.91*	0.76*	14
1981	0.62*	0.71*	0.78*	0.85*	0.94*	0.72*	1407
1986	0.63*	0.73*	0.81*	0.88*	0.99	0.72*	1554
1991	0.65*	0.72*	0.79*	0.82*	0.85*	0.71*	a
1996	0.64*	0.70*	0.77*	0.80*	b	0.68*	a
Other Paper Products Manufacturing							
1976	0.45*	0.70*	0.93*	1.14	b	0.54*	69
1981	0.59*	0.68*	0.75*	0.79*	b	0.66*	a
1986	0.66*	0.74*	0.81*	0.87*	b	0.71*	a
1991	0.60*	0.72*	0.81*	0.90	b	0.67*	339
1996	0.70*	0.75*	0.79*	0.79*	b	0.73*	a
Rubber Footwear Manufacturing							
1976	0.51*	0.76*	0.95*	1.08*	1.26*	0.73*	75
1981	0.56*	0.71*	0.85*	0.94	1.06	0.73*	487
1986	0.64*	0.70*	0.76*	0.79*	b	0.69*	a
1991	0.55*	0.68*	0.79*	0.88	1.06	0.65*	505
1996	0.66*	0.74*	0.79*	0.85*	0.98*	0.7*	a
Stationery Articles Manufacturing							
1976	0.71*	0.78*	0.83*	0.84*	b	0.75*	a
1981	0.57*	0.83*	1.04	1.08	1.43*	0.74*	120
1986	0.67*	0.81*	0.91*	0.98	b	0.75*	171
1991	0.55*	0.74*	0.88	0.98	1.19*	0.66*	168
1996	0.65*	0.73*	0.79*	0.85*	0.92*	0.69*	a

Notes : a) There is no firms with estimated CE • 1.
b) No firm belongs to the size category.
* Significant at the 0.05 level that CE>1 or CE<1.

Source: *Industrial and Commercial Census* (in Chinese), 1976, 1981, 1986, 1991, 1996.

APPENDIX E: THE TEST OF GILBRAT'S PROPORTIONATE GROWTH MODEL

This appendix utilizes the Galton-Markov growth process proposed by Hart and Oulton (1996) to test Gibrat's proportionate growth model.[41] In a first-order Galton-Markov process, the model provides a stochastic regression of firms' growth in explaining whether there is regression towards the mean in which the employment of small firms grows more quickly than that of large firms during the period.[42]

Estimates of the Galton-Markov model are presented in Table A7. To measure the relationship between employment growth and firm size, a set of sequential regression which includes different ranges of employment of observations was used. The results show that the regression coefficients increase monotonically from 0.60 to 0.86, 0.53 to 0.78, and 0.52 to 0.76 as larger firms are added to the regression over the different periods. The empirical findings are clear enough to show that these smaller firms generated proportionately more jobs than the larger firms.

Table A7 Galton-Markov Regression for Employment Growth

Employment Size		1981-1986	1986-1991	1991-1996
<=4	Beta	0.6070	0.5370	0.5246
	S.E.	0.0110	0.0098	0.0085
	R^2	0.1282	0.1135	0.1008
	N	20380	23442	33775
<=8	Beta	0.7087	0.647	0.6201
	S.E.	0.0073	0.0063	0.0520
	R^2	0.2450	0.2284	0.2038
	N	29035	35553	53880
<=16	Beta	0.7829	0.7002	0.6574
	S.E.	0.0054	0.0045	0.0037
	R^2	0.3686	0.3421	0.3016
	N	34747	45347	70483
<=32	Beta	0.8132	0.7363	0.6918
	S.E.	0.0043	0.0035	0.0030
	R^2	0.4714	0.4491	0.3933
	N	38878	52835	81735
<=64	Beta	0.8364	0.7536	0.7215
	S.E.	0.0036	0.0029	0.0026
	R^2	0.5591	0.5235	0.4640
	N	41805	57558	87870

[41] The proportionate growth models of Gibrat (1931) argue that firm growth is independent of firm size and there is no tendency for small firms to grow more quickly than large firms.

[42] The first-order Galton-Markov process model is defined as:
$y_i(t) = \beta y_i(t-1) + \varepsilon_i(t)$ where $y_i(t)$ is the employment level for firm i at time t . The value of β is less than one, which indicates that the employment of small firms grows more quickly than that of larger firms.

Employment Size		1981-1986	1986-1991	1991-1996
<=128	Beta	0.8517	0.7671	0.7401
	S.E.	0.0031	0.0026	0.0024
	R^2	0.6219	0.5763	0.5093
	N	43694	60228	90714
<=256	Beta	0.856	0.7761	0.7539
	S.E.	0.0029	0.0025	0.0023
	R^2	0.6576	0.6098	0.5388
	N	44738	61544	91916
<=512	Beta	0.8576	0.7848	0.7629
	S.E.	0.0027	0.0024	0.0022
	R^2	0.6781	0.6308	0.5559
	N	45244	62102	92380
<=1024	Beta	0.8611	0.7883	0.7693
	S.E.	0.0027	0.0023	0.0022
	R^2	0.6908	0.6406	0.5661
	N	45455	62309	92591

Source: *Industrial and Commercial Census* (in Chinese), 1981, 1986, 1991, and 1996.

Note: Dependent variable is log(employment$_t$), independent variable is log(employment$_{t-1}$), where t=1986,1991, and 1996, t-1=1981,1986,1991. Beta is the estimated coefficient from OLS. S.E. is the standard errors. N is the number of observations in the regression.

APPENDIX F: THE MARKET AND EMPLOYMENT SHARES OF SMES DURING THE CRISIS

The performance of SMEs in circumstances of crisis can help us better understand how they exert their advantages to thrive in the economy, in bad times as well as good. The rising trend of Chinese Taipei's SMEs first appeared in the mid-1970s, during the outbreak of the first oil crisis. Then in the mid-1980s, as a major economic transformation took place, their rise acquired even stronger momentum. And though there has been only scant data released since the Asian financial crisis blew up in mid-1997, our faith in the resilience of the SME sector is strong.

For example, since SMEs[43] are defined for administrative purposes as including firms larger than our upper bound of 100 employees, it is not a surprise to note that official figures employing this definition show a recent decreasing trend in their market share (Table A8). Still, there was no significant difference in the situation of SMEs found before and after the crisis. The employment share of SMEs (including the public sector) was also decreasing at a steady rate (Table A9).

Table A8 Market Shares of SMEs in Chinese Taipei, 1995-1998 Unit: %

Market Share of SMEs	1995	1996	1997	1998
Manufacturing Industry	36.11	34.43	32.74	30.39
Whole Economy	35.97	34.29	32.11	30.36

Source: Ministry of Economic Affairs, *White Paper on SMEs* (1999).
Note: SMEs in manufacturing, construction, mining & quarrying industries are defined as enterprises with paid-up capital of no more than NT$60 million, or a work force of fewer than 200 persons. In other industries, the upper limit of SMEs is turnover NT$80 million, or 50 employees.

Table A9 Employment Shares of SMEs in Chinese Taipei, 1995-1998 Unit: %

Employment Share of SMEs	1995	1996	1997	1998
Manufacturing Industry	80.95	78.95	78.50	77.15
Whole Economy	70.83	69.24	69.27	69.19

Note: SMEs in manufacturing, construction, mining & quarrying industries are defined as enterprises with paid-up capital of no more than NT$60 million, or a work force of fewer than 200 persons. In other industries, the upper limit of SMEs is turnover NT$80 million, or 50 employees.
Source: Ministry of Economic Affairs, *White Paper on SMEs* (1999).

Furthermore, of all the people that lost their jobs during 1998, only 68.53% were originally hired by SMEs. This figure is less than the employment share of SMEs (69.19%). On the other hand, in 1998, the growth rate of new firm formation was 5.33%, while the exit rate was only 3.34%. More than 80 thousand new firms were established in 1998, compared with less than 51 thousand that closed down in the same year. Thus, in spite of the economic impact of the financial crisis, there was still a net increase of 29 thousand enterprises in Chinese Taipei. Of all the new firms established during 1997 and 1998, 99.36% came within the official definition of SME. These and other statistics

[43] To take manufacturing industry as an example, SMEs are defined as enterprises with paid-up capital of no more than NT$60 million, or a work force of fewer than 200 persons.

reassure us that a well-developed SME sector helped cushion the impact of the crisis on the economy.

APPENDIX G THE ELASTICITY OF FACTOR SUBSTITUTION OF SMES

Another possible source of flexibility is exhibited in a firm's ability to change its factor intensity rapidly when the relative factor price is changing. For example, in a wage-increasing environment such as Chinese Taipei today, since the capital price is relatively stable, firms should increase their capital intensity in production. The more easily a firm adapts its production to the new technology, the more 'flexible' it is. We can use 'elasticity of factor substitution' to measure the easiness of this kind of transformation in production process.

Table A10 reports estimated elasticity of substitution between labor and capital inputs in nine of Chinese Taipei's manufacturing industries between 1986 and 1991. In both the rubber footwear and aluminum products manufacturing industries, SMEs were more elastic (or flexible) in factor substitution than large firms. In some industries, such as cotton spinning and cement products, while SMEs appeared to perform worse than their larger counterparts back in 1986, the situation had reversed in 1991. Similar evidence has been found elsewhere, including India (Little, Mazumdar, and Page, 1987) and the U.S. (Nguyen and Reznek, 1993; Nguyen and Streitwieser, 1999).

Table A10 The Labor and Capital Substitution Elasticity in Chinese Taipei Manufacturing

		SMEs[a]		LEs[a]	
Industry	**Year**	**Mean**	**Number of Enterprises**	**Mean**	**Number of Enterprises**
Spinning of Cotton	1986	0.86	964	0.87	80
	1991	1.47	1009	1.39	55
Wooden Furniture and Fixtures	1986	1.11	1678	1.12	73
	1991	1.15	2006	1.16	50
Printing	1986	1.11	2016	1.04	13
	1991	1.65	5942	1.66	25
Rubber Footwear	1986	1.24	494	1.20	35
	1991	1.50	590	1.47	26
Plastic Articles	1986	1.61	1058	2.53	21
	1991	1.09	2457	1.08	22
Cement Products	1986	1.21	738	1.23	18
	1991	0.90	549	0.79	11
Metallic Hand Tools	1986	1.34	2661	1.43	28
	1991	1.04	2795	1.03	13
Metallic Constructive Materials	1986	1.25	4091	1.33	13
	1991	0.96	4887	0.96	16
Aluminum Products	1986	1.48	1844	1.43	16
	1991	1.45	2537	1.43	17

Source: Schive and Hu (2000).
Note: SMEs and LEs are enterprises hiring fewer than 100 persons and 100 and above, respectively.

APPENDIX H: THE ORIGIN OF CHINESE TAIPEI'S VERTICAL DISINTEGRATION

This appendix aims to study the origin of Chinese Taipei's vertical disintegration. In light of the theory of multiple equilibria it is worth emphasizing that there may be "*circular causation*", that is, one phenomenon may be a cause as well as a result of another phenomenon. For example, is usually argued that one important cause of the vertical disintegration of Silicon Valley is that the personal computer industry has rapidly changing product designs and technologies. For example, Saxenian (1991, p.426) observes that "Innovative producers like Conner Peripherals and Quantum have explicitly avoided vertical integration. … Facing the pressures of rapidly changing product designs and technologies, they rely heavily on third party sources for most components and perform only the initial design, the final assembly, and testing themselves."

However, the pace of new product introductions and technological changes is endogenously determined. Therefore it remains for us address why the PC industry introduces new products and technological changes, faster than the mainframe computer industry. One may argue that the vertical disintegration itself might be also a cause of the features of the PC industry. Let us begin with noting that both Silicon Valley and Chinese Taipei are two of the leading players in the PC industry, and, as noted above, these two districts have vertically disintegrated industrial organizations. Accordingly, the distinguished features of the PC industry might be a result of the vertical disintegration. Actually, as mentioned above, in a vertically disintegrated industrial organization, the entry barriers are relatively low and the competition is relatively fierce, and hence it is plausible that there would be a faster pace of new product introductions and technological changes, especially compared with the mainframe computer industry which has a vertically integrated industrial organization.

The theory of multiple equilibria implies that it is more appropriate to use "history" to interpret the origin of a particular equilibrium than to use "*current*" properties. There does exist an important historical accident that fundamentally shape the industrial system of Silicon Valley. Saxenian (1994, p.12) observes that while Stanford and MIT encouraged commercially oriented research and courted federal research contracts in the post-war period, MIT's leadership focused on building relations with government agencies and seeking financial support from established electronics producers. In contrast, Stanford's leaders actively promoted the formation of new technological enterprises and collaborative relationships between small firms. One reason for Stanford's leaders to adopt this strategy is that they lacked corporate or government ties or even easy proximity to Washington.

Next we shall examine the origin of the vertical disintegration of industry in Chinese Taipei. Utilizing the theory of transaction costs, Levy (1991, p.175) argues that one reason for the vertically disintegrated industrial organization of Chinese Taipei is that Chinese

Taipei had relatively low transaction costs at the outset of export-led industrialization.[44] However, this explanation also has the problem of circular causation since the level of transaction costs is endogenously determined. Below we try to utilize the idea of the anti-trust policy to provide alternative explanations.

From the viewpoint of the anti-trust policy, it is important to restrain the economic power of large enterprises with monopoly power since such large enterprises may behave strategically to quash new entrants and hence raise the entry barrier to a sufficiently high level. Therefore, in order to help SMEs perform competitively, it might be more important to restrain large enterprises than to directly help the SMEs.[45] In Chinese Taipei the large enterprises are, intentionally or unintentionally, restrained in many ways:

(i) **Anti-merchant tradition.** Chu (1999, pp.16-7) notes that the Chinese Taipei administration was more cautious in fostering private enterprises, in contrast to how the Korean government went out of its way to promote the private chaebol. For example, requests by Formosa Plastics Company, the largest conglomerate in Chinese Taipei, to build its own naphtha cracker were repeatedly turned down before being finally granted in the late 1980s. The anti-merchant tradition has often been criticized as hindering economic development. However, its effect might in fact be similar to that of anti-trust policy, even though it stems from completely different motivations.

(ii) **Chinese inheritance custom.** Under the Chinese inheritance custom, parents divide the estate among their children (Hsiao and Hsiao, 1996, p.17, Chu, 1999, pp.19-20).

(iii) **Fragmented land system.** Hu (1987) notes that the land system of traditional China was much more fragmented than its counterparts in traditional European countries. In Chinese Taipei, the fragmentation of the land system is often criticized as hindering large-scale economic development projects.[46]

(iv) **Rugged individualism.** Chinese have an often-cited proverb, "Better to be the head of a chicken than the tail of an ox." The fact that so many desire to be their own boss increases the governance cost of internal organization, and reduces the cost of using the market (Chu, 1997, p.63).

Furthermore, the formation of the SME sector in Chinese Taipei was helped by two historical accidents. First, there were not many big enterprises at the onset of modern

[44] As mentioned in Section 3.1, in case studies of Chinese Taipei's keyboard and personal computer assembly, Levy and Kuo (1991, p.365) note that the presence of Chinese Taipei's independent traders willing and able to explore the prospects for export of the products of nascent small and medium firms is one reason why Chinese Taipei's entrepreneurs can initiate production at a relatively small scale with little up-front investment. If our purpose is to interpret the vertical disintegration of particular industries such as keyboard and computer assembly, the above explanation is meaningful. However, if our purpose is to interpret the vertical integration of the whole economy, this explanation is meaningless since there is circular causation: the presence of independent traders might also be a result of the presence of SMEs.

[45] As for the industrial policy, although in Chinese Taipei the first material policy for promoting SMEs was promulgated in 1967[45], the impact was either small or generally unclear (Hu and Schive, 1998).

[46] Sato (1983) has a similar argument, noting that one important factor in the development of the subcontracting system which cannot be overlooked is the lack of physical space in Japan which constrains factory space in the narrow plains, like the Kanto Plain.

economic development (Hong, 1997, pp.132-3). The reason runs as follows. During the Japanese colonial period, Chinese Taipei served mainly as an agricultural base. Furthermore, due to the lack of inducement such as natural resources and/or the encouragement of the Japanese government, no major Japanese *zaibatsus* set up their businesses in Chinese Taipei. More importantly, there were no local capitalists who owned disproportionate wealth in Chinese Taipei at the end of the Second World War.

Second, after the war, the government tried to separate the political elite from the business community to prevent corruption and cronyism (Hong, 1997, pp.134-6; Root, 1996, pp.33-34). In other words, the above mentioned anti-merchant tradition was revived. The government enjoyed especially favorable circumstances for achieving this separation. As immigrants from the mainland, the government had no vested interests in the local society.

In Chinese Taipei's modern development, broad-based growth, rather than the well being of a small elite, was pursued. That is, to base modernization upon the mass of the population, including farmers and small business owners, rather than upon a few big businesses. As a result, the ideology advocated by the founding father, Dr. Sun Yat-sen, was proclaimed. This ideology concerns the well being of all citizens rather than just a small elite. Among other things, it unambiguously contends that private capitalists should be restrained and land-ownership should be equitably distributed. Therefore, at least in part in order to realize the ideology, the following two policies were adopted:

(i) **Land reform.** The land reform of the 1950s took land from large landlords and gave it to tenant farmers. Landlords were paid in shares of former state-owned industries, encouraging them to move from agriculture to industry.[47] It is interesting to note that, according to the modern contract theory, mentioned in Section 2.1, this land reform had dual virtues: it not only improved income distribution but also raised efficiency since owner-farmers have better incentive to work. The land reform proved to be much more successful in Chinese Taipei than in many other developing economies Hu (1987).

(ii) **Public enterprises.** After the Second World War, the government was able to take over enterprises left by the Japanese. As almost all significant enterprises had been owned by the Japanese, the government was able to control a major proportion of industrial activities and hence the growth of private business groups was somewhat restricted in the earliest stage of post-war industrialization (Chu, 1999, p.16).

Meanwhile, the United States, the principal source of foreign aid for Chinese Taipei in the 1950s, played an important role in policy formation. Root (1996, p.33) notes that the U.S. was sharply critical of the administration and was committed to overcoming corruption.

There were still other policies that were important in formatting the SME sector. Scitovsky (1990, pp.138-141) argues forcefully that the high interest-rate policy adopted by Chinese Taipei had an unintended side effect in helping format the SME sector. Scitovsky begins with noting that at a time when the universally approved and practiced policy in developing countries was to keep interest rates low to encourage capital accumulation and growth, Chinese Taipei broke new ground and raised the interest rates paid to savers and charged to borrowers at levels almost unheard of that time. Because *the*

[47] Van Warmelo (1967) also notes that the land reform helped in formatting the SME sector.

high interest-rate policy kept the actual interest rates close to the equilibrium, it produced many desirable results: bringing inflation to a halt, accelerating capital accumulation and growth, cutting unemployment to a low level and achieving equity.[48] There are two reasons why the high interest-rate policy helped in developing the SME sector. First, a high interest-rate policy restrains the rate at which the size of the individual enterprise grows. Second, a low interest rate usually leads to tremendous credit rationing, which usually favors large firms, the bank's established customers, or those whom government wants to favor.

It is interesting to note that the high interest-rate policy again was related to a historic accident. Scitovsky states that the policy was devised, outlined, and advocated as a means of curbing hyperinflation during Second World War and the civil war, by a Chinese economist, Professor S.C. Tsiang, in two Chinese-language articles published in 1947 in the *Shanghai Economic Review.*

[48] These outstanding performances lead Scitovsky (1990, p.139) to emphasize that " Indeed, the originator of the policy and Taiwan's pioneering role in developing its application have been all but forgotten, which is regrettable because Taiwan's prolonged and consistent adherence to it has also had further advantages much less known but no less important."

Individual Report IV (the Philippines)

Social Impacts of the Asian Financial Crisis

(Contents)

Social Impacts of the Asian Financial Crisis

1. Introduction

The study aims to examine the impact of the regional financial crisis on the various social sectors of APEC economies and to recommend policy options that would minimize the adverse effects of any similar crisis in the future. As almost two years have elapsed since the crisis started, the study seeks to provide empirical evidence on its effects and the implications for social sectors. The study draws from empirical results of various existing studies.

The study starts with an examination of the impact of the financial crisis on the budgets of the affected economies, particularly that for the social sectors. Specifically, the study focuses on the following areas: employment/unemployment; education and human capital; health and nutrition, gender dimension and other social impacts.

Given the fragmented nature of social statistics, we have also made use of other indicators, for example, rising prices, lay-offs, and business closures, to explain the social effects of the crisis. Responses of affected groups to questions on the crisis, though qualitative, give significant indications of how they were affected by the crisis. .

2. Impact on the Social Sectors

The financial crisis in the Asian region has caused difficulties to a number of its economies. After decades of unprecedented growth, Southeast and East Asia's growth fell. In the worst affected economies like Thailand, Indonesia and Korea, growth in the gross domestic product (GDP) turned abruptly negative in 1998 following a period of growth of over 7% per annum (1992 – 1996). Economies that have been less affected, namely the Philippines and Singapore, also experienced a deceleration in growth in 1998 (-0.5% and 0.4% respectively).

The huge currency depreciation in most of these economies severely raised costs of imports and pushed up inflation rates resulting in a sharp fall in consumption and average income. With the reversal of growth in domestic output, the concomitant impacts of the crisis are related to job losses; scarcity of food and rising food prices; and squeezes on basic social programs, especially health and education, as a result of budget constraints. There is greater concern though about the distributional consequences of the crisis, particularly its impact on the various social sectors.

The transition economies of China and Vietnam have both managed to avoid the severity of economic dislocation suffered by others in the region. However, they also face the challenges of implementing reforms in the financial and state-owned enterprise sectors, risks of rising unemployment, and in China's case the need to create new social programs to replace those provided in the past by public enterprises.

2.1 Government Social Expenditures

Affected governments tried to maintain the levels of developmental expenditures (including education, health, social security and welfare, housing and community

amenities and economic services) by cutting back on expenditures on defense and other expenditures.[1] Korea, Malaysia and Thailand posted declines in defense and other expenditures in 1997. Reduced expenditures, however, were recorded for housing and community services for the Philippines and Korea during the same year.

On the other hand, affected economies managed to increase their budgets for education, health and social services. Thailand undertook additional saving measures in other areas such as the budgets of the ministries of agriculture, interior and cooperatives which have extensive community programs. Health and education budgets stood at 73 million baht and 219.7 million baht during fiscal year 1998 from 71.3 million baht and 203.8 million baht in fiscal year 1997, respectively. Fiscal expenditures overall for 1999, however, continue to lag behind program targets. The 2000 fiscal year budget amounting to 860 billion baht was approved by the Cabinet in April 1999 and submitted to Parliament. Education and public health are proposed to receive a 6.8% and 5.3% increase over their previous year's budgets. If approved, education will command the largest share of the proposed budget at almost 20% while public health will take a share of 7.6%. (World Bank Social Update, September 1999)

Based on World Bank (WB) data, the Korean government's expenditure on health (as a percentage of total government expenditure) remained almost the same in 1997 and 1998. However, government expenditures on education declined in 1998. Vietnam's education and health budgets that accounted for less than 20% of total government's expenditure have not changed much during the same period.

With reduced fiscal resources, the Philippine government imposed a 25% mandatory reserve to the 1998 budget of all agencies and a 10% cut in the internal revenue allotment of local government units. Government hiring has also been frozen in response to the growing budgetary deficit. There was an attempt to protect social services sector spending by lifting the mandatory reserve on selected basic social services but the release of funds came late. The social services' share of national government expenditure rose to an estimated 42.3% in 1998 from 38.5% in 1997 and 31% in 1991. The social services' share of total national government expenditure is estimated to further increase, to 44%, with the shares of health and education remaining relatively constant.

Malaysia initially announced a reduction in government expenditures by 20% and postponed several infrastructure projects in 1998 but eventually announced a counter-cyclical policy when the GDP became negative in the first quarter of the same year. Expenditures for the education and health sectors, however, declined in 1998, although still within pre-crisis levels. For the 1999 budget, development expenditure has increased, to 2.1% of GDP from an average of 1.6% during the pre-crisis years, to provide essential services to the poor and non-poor (APEC Finance Ministers' Sectoral Brief, May 1999).

However, the WB, in its September 1999 Social Update, indicated that efforts by Indonesia to maintain government spending on health and education at constant real levels have not been successful. The WB estimated public spending to have fallen by 8% in 1997/98 and by a further 12% in 1998/99, representing a 9% and 13% decrease, respectively, in per capita terms. The WB further noted an increasing gap between

[1] Other expenditures cover those for government cooperatives, private sector and state enterprises. Source of data is the 1998 Asian Development Bank (ADB) Key Indicators of Developing Asian and Pacific Countries).

budgetary allocation and actual expenditures since the crisis, from 10% in 1994-97 to 32% in 1998/99. Public sector expenditures in education likewise fell by 41% between 1996/97 and 1997/98 but rebounded somewhat in 1998/99 to 72% of pre-crisis levels. Total realized public spending for education has also declined in terms of shares of total government revenues and of total GDP in 1997/98 compared to 1996/97. Budgetary allocation for both sectors for 1998/99 was still lower compared to the 1997/98 levels.

2.2 Employment

In a study done by Malaysia and the World Bank on the Asian crisis, impact and lessons learned, it was observed that unemployment has risen in most economies but its incidence and impact varies across economies by region and by skills level. Unemployment rates rose sharply in 1998 as compared to 1997 levels: Indonesia, from 4.3% to 5.1%; South Korea, from 2.6% to 6.8%; Thailand, from 1.5% to 4.4%; Malaysia, from 2.4% to 3.2% and the Philippines from 8.7% to 10.1%. The unemployment rate for Singapore also rose from 1.8 % in 1997 to 3.2 % in 1998. Unemployment rates for some economies, however, were still on the uptrend in 1999.

Table I: Unemployment rates (percent)

	1992	1993	1994	1995	1996	1997	1998	1999
Korea	2.4	2.8	2.4	2.0	2.0	2.6	6.8	6.9
Indonesia	2.7	3.1	4.4	7.2	4.9	4.3	5.1	6.4/a
Malaysia	3.7	3.0	2.9	3.1	2.5	2.4	3.2	3.0
Philippines	9.8	9.3	9.5	9.5	8.6	8.7	10.1	9.7
Thailand	2.6	2.6	2.6	1.7	1.54	1.51	4.4	4.2
Singapore	2.0	1.9	2,.0	2.0	2.0	1.8	3.2	3.5
China	2.3	2.6	2.8	2.9	3.0	3.1	3.1	3.1

Source: National authorities of respective APEC economies.
/a = fiscal year from March 1999 – April 2000.

The most severely affected economies have all experienced massive lay-offs as the crisis impacted on the real economy. In Korea, up until February 1998, most of the lay-offs occurred in connection with enterprise bankruptcies. The number of bankruptcies ranged between 1,000 and 1,500 per month in the first 11 months of 1997 jumping to over 3,000 in December before finally dropping to 2,749 in March 1998. While modest job losses were recorded in the last two months of 1997, they were accelerated by the economic recession with total employment falling by 686,000 jobs in January 1998 as compared to January 1997.

Korea's unemployment rate rose further to as high as 8.7% in February 1999, before declining to 5.7% in August 1999. Demoralized and discouraged, a large number of people gave up searching for another job upon becoming unemployed. Most of the unemployed were the low-paid workers – the temporary and daily workers, the self-employed and unpaid family workers – and unlikely to have had unemployment insurance. Between the second quarter of 1997 and the last quarter of 1998, some 1.2 million people were estimated to be unemployed.

In Indonesia, business contraction as well as the liquidation of 16 banks in November 1997 and another seven in March 1998 led to a large number of lay-offs affecting not only the low income and low-skilled workers but middle-income and highly skilled workers as well. Although open unemployment rose from 4.7% in August 1997 to 5.5%, in August 1998, the decline in real wages, however, has been seen to have far more impact on family welfare. Moreover, a shift in employment from the formal to the informal sector, as well as from the modern to the agricultural sector, has been observed (WB Social Update, September 1999). The percentage of workers employed in the informal sector rose from 62.5% to 65.4% between 1997 and 1998. Those working in the agricultural sector rose from 40.8% in 1997 to 45% of the labor force in August 1998.

The financial crisis caused significant increases in unemployment and underemployment in Thailand. Some 54,000 workers were recorded as having been retrenched in Thailand over the period January 1997 to February 1998. These reflect only those lay-offs where severance payments were made. The actual number of crisis-induced lay-offs, however, was believed to be substantially higher. The Industry Association in Thailand reported job losses of some 422,000 by the end of 1997. By May 1998, the number of unemployed stood at 1.61 million or 5.3% of the labor force compared to only 2.1% in May 1996. This figure rose further to 1.76 million people or 5.6% of the total labor force as of May 1999.

A substantial number of job losses arising from the crisis has also been recorded in the Philippines. Some 3,072 firms involving 155,198 workers reported closures/retrenchment and job rotation in 1998 as compared with the 1,156 establishments involving 62,724 workers reported in 1997. In 1999, the number of establishments reporting closure and reduction of the workforce numbered 2,963 firms and involved 157,432 workers. The number has since gone down, falling to 1,009 firms involving 23,928 workers during the first five months of 2000.

Balisacan and Edillon in their paper entitled “Human Face of the Asian Crisis: What Do Nationwide Panel Data on Philippine Households Show” (July 1999) found that during the first quarter of 1998, those in the agricultural and construction sectors appeared to have suffered the most. The unemployment rate among those initially employed in the construction sector even increased up to the last quarter. Household heads initially employed in the mining and quarrying sectors were found to be least affected, while those working in the electricity, gas and water industries seem to have been re-employed towards the year-end. However, the finance sector was found to have the lowest proportion of retained workers from its end-1997 roster, implying that many who were originally from the finance sector had to shift to other sectors of employment. Closures or shutdowns were common among small establishments while retrenchments, rotations or reduction of working hours were prevalent among larger firms. These occurred mostly in the National Capital region (more than 50%) and in manufacturing establishments, apparently as a result of the combined effects of the continued slump in market demand, which prompted a number of enterprises to reorganize or to downsize, and the peso depreciation. Further, the El Nino phenomenon undermined the capacity of the agricultural sector to absorb workers laid-off from the manufacturing, construction and services sectors. However, the unemployment rate as of the second quarter of 1999 (8.4%) improved somewhat compared with the first quarter and with the previous year’s figures.

In Malaysia, the unemployment rate increased modestly (from 2.4% in 1997 to 3.2% in 1998). This was aided by falling real wages and the repatriation of migrant workers. Some

displaced workers were absorbed by the agricultural sector and export-oriented industries which despite the crisis experienced labor shortages. While the unemployment rate had reached 4.5% in March 1999, this was due more to new additions to the labor force rather than to retrenchments. Malaysia, nevertheless, was affected by labor strikes which rose from five in 1997 to 12 in 1998 and which affected 2,396 and 2,685 workers, respectively.

In China, urban open unemployment has risen sharply. The World Bank, in its recent report, noted that while the officially registered unemployment rate (excluding laid-off workers) remained at 3.1% by the end of 1998, the stock of laid-off workers as of June 1999 had risen to 5.4 million, with an annual outflow of 3.5 million expected in the next few years. Streamlining government bureaucracy, a part of the reform of government administration, has resulted in a 45% cut in central government staff. Local government streamlining is further expected to cut by half the existing workforce of about 5.5 million. The WB noted that increasing urban unemployment has posed a threat to social stability. An example of this is the rising incidence of crime and labor disputes, the number of which was observed to have doubled during the first half of 1999 compared to a year ago. Viet Nam's unemployment rate was contained at 2.2% in 1998 despite a considerable slowdown in GDP growth from 8.2% in 1997 to 3.5% in 1998.

In general, much of the increase in unemployment has been concentrated in cities and urban areas e.g., the Bangkok metropolitan area, although some traditionally poor areas, e.g., the northeast of Thailand, have also experienced substantial increases in the number of unemployed. The impact of unemployment in the rural areas of Korea, the Philippines and Indonesia appears smaller than in urban areas.

The change in employment has not been gender- or age–neutral. Female-headed households are a particularly vulnerable group in most societies. In Korea, where only a small number of women are employed, the women tend to lose their jobs first. In Thailand, more than 50% of the 53,896 laid-off workers reported were women (based on data from the Ministry of Labor and Social Welfare for the period January 1997-February 1998). The combined effects of a decline in new hiring as well as an increased labor force in affected economies are seen to reduce employment and re-employment prospects of both new entrants and older workers, In Korea, those in the 20-29 age bracket and those who are less educated were observed to have been the most adversely affected by the crisis.

The phenomenon of reverse labor migration has been observed in the affected economies.[2] A government survey in Thailand reported some 188,000 workers returning to rural areas as of January 1998. In Indonesia, employment in agriculture increased by more than 5 million in 1998 while the number of non-agricultural workers was reduced by 2.3 million people during the same period.

The crisis also put pressure on economies hiring foreign workers and on labor-supplying economies. Declining labor demand has forced the host economies to repatriate foreign workers to cut down on costs and provide opportunities for their citizens. Malaysia has

[2] Reverse labor migration occurs when sectoral employment shifts from urban to rural areas, or more specifically from industry to agriculture. It also applies to displaced overseas workers as they try to find employment in their home economies, further aggravating the unemployment rate. This type of migration implies a loss of remittances to the home village or economy, as the case may be, as well as increasing the socio-economic stress on the communities trying to absorb the newly unemployed.

cancelled plans to repatriate the legal workers, and instead has decided to allow the importation of new foreign workers especially for plantation sectors, export oriented and strategic industries in the manufacturing sector and also a small number for the construction and services sectors. As of 16 March 1999, approvals were given to 1,574 employers to recruit a total of 116,408 foreign workers, mostly from Indonesia. The dramatic rise in outward migration of foreign workers from Indonesia beginning in1997 absorbed at least some portion of the labor force that lost some employment as a result of the crisis.

In Thailand, first to be affected by the crisis were some 17,000 foreign workers, mostly Burmese, who lost their jobs in August 1997. Some 200,000 workers were also reportedly repatriated between 1 January and April 1998 while unofficial estimates indicated that about 230,000 illegal immigrants were repatriated between 1 May and 11 June 1998. The Labor Ministry announced a three-year period to repatriate foreign workers starting 1998.

Chinese Taipei announced in 1997 that employers must reduce their workforce's maximum percentage of foreign workers from 30% to 25%. The 50% proportion of foreign workers allowed for major public construction projects stayed unchanged. In June 1998, the government announced plans to cap the number of foreign workers at 300,000 to create jobs for 200,000 Chinese Taipei's aborigines.

The abrupt retrenchment, repatriation and loss of income of migrant workers meant, for many, the inability to repay debt leading to eventual entrapment in a vicious debt and poverty cycle. In the Philippines, other economies are viewed as a market for surplus labor and a good source of foreign currency in the form of remittances. With the economic downturn in 1998, employment of Filipino labor overseas declined, mainly because of a decrease in deployment in Hong Kong, China; Chinese Taipei; Malaysia; Singapore; and Thailand.

The Asian Development Bank (ADB) in its May 2000 update on Asia's recovery noted a fall in the unemployment rates in some of the affected economies in 1999, although they remain higher than pre-crisis levels. The ADB offered two possible reasons a) falling unemployment rates could partly be a result of declining labor force participation rates and b) falling unemployment masks an increase in low paid jobs. The ADB, however, noted that the real wage indices in Korea, the Philippines and Thailand now exceed their pre-crisis levels.

2.3 Income, Prices and Poverty Alleviation

Early predictions on the impact of the crisis on poverty levels in the crisis affected economies suggested that this would be deep and widespread. However, recent analyses paint a varied picture. Some households have coped well in some economies while others have been adversely affected.

It was initially estimated that the proportion of Indonesian households falling below the poverty line would reach 40% of the total population in1998. While recent data from several sources confirms that the large rise in incidence and depth of poverty in Indonesia has indeed taken place, there have been indications that the magnitude could have been lower than initially estimated. The WB in its report using the December 1998 Indonesia National Social and Economic Survey (SUSENAS) sub-sample of 10,000 households as

its basis, indicated a rise in the percentage of households falling below the poverty line, from 11.3% in 1996 to 16.7% in 1998, if the 1996 methodology for poverty analysis is used. On the other hand, the revised government methodology results in a rise from 19.2 to 24.2 percent, a similar number of new families but a lower percentage rise in poverty. The WB found these estimates to be consistent with earlier reports from the ILFS2+ and the UNICEF 100 Villages Survey. The said survey showed the poverty headcount rising from 11% in May 1997 to 18% in August before falling slightly to 15.2% in December 1998. The WB, however, cautions that not all sections of society are coping well. All survey sources show the heterogeneous geographical impact as well as an increasing number of rural households falling below the poverty line between 1997 and 1998. Further, the overall Gini coefficient, which measures the degree of inequality, has changed very little over the crisis period. The WB also noted that the poor have faced higher inflation than the rich due to the importance of food in their consumption basket.

Thailand's poverty headcount also increased, from 11.4% in 1996 to 13.8% in 1998 as an additional 1.1 million people fell below the poverty line. It was observed that the decline in real income was most severe for those with education levels less than or below elementary levels, small and medium-sized enterprises and those dependent on the informal sector for employment. Welfare losses, however, have been cushioned in a variety of ways through adjustments made by the Thai people e.g., migration, changes in consumption pattern and informal sector safety nets as well as the implementation of the government's social reform agenda.

Despite substantial measures undertaken by the Korean government, urban poverty rose dramatically from 8.5% in 1997 to nearly 23% through the third quarter of 1998 while the Gini coefficient of consumption expenditure increased slightly from 29% in 1997. Poverty began to decline from the fourth quarter of 1998 (15.8%) with the resumption of GDP and consumption growth. Nonetheless, it may still take time for the effects of the crisis to subside.

Kakwani and Son (September 1999) attempted to decompose the difference in inequality in Thailand and Korea. In their paper, it was found that the saving effect is, overall, much larger for Korea than Thailand which suggests that the percentage of the population defined as poor when estimated by consumption is higher for Korea compared to Thailand. The paper, however, found that with regard to the distribution effect on the poverty difference, the magnitude of absolute values is larger for Thailand. The difference in the relative inequalities estimated by income and consumption is found to be far greater in the case of Thailand than in Korea. Moreover, the distribution effect in Thailand has been found to be consistently negative, which indicates that the relative distribution of income is more unequal than that of consumption. A reversal of the distribution effect, from positive to negative, in the case of Korea, during the 1990 – 98 period was observed, i.e., that the relative distribution of consumption is initially more unequal and then becomes more equal than the distribution of income. It was further noted that while the saving effect is far dominant over the distribution effect in Korea, the distribution effect outweighs the saving effect in Thailand. The study finally argued that while Korea's population has a higher percentage of poor when poverty is estimated in terms of consumption, Thailand has a higher incidence of poverty estimated by income.

Poverty incidence and unemployment have also increased in Malaysia, and new vulnerable groups emerged as a result of the crisis. Higher poverty incidence was not

confined to the poorer states (Kelantan, Terengganu and Sabah) but occurred in the urban areas as well. The poor are disproportionately burdened by rising prices although inflation has been moderate.

Based on the latest data, poverty incidence in the Philippines declined to 31.8% in 1997 from 35.5% in 1994. However, the crisis may have eroded the improvement achieved in previous years as evidenced by increases in food prices, job losses in agriculture and in industry, and by continued downward pressure on real wages, which is also reflected in declines in the remittances of overseas Filipino workers. The study of Balisacan and Edillon (July 1999) showed that there were more households coming from the poorer households who were affected by price increases. Loss of jobs within the country and the reduction in wages seem to have affected the middle income deciles while the loss of jobs overseas affected more of the upper income deciles.

The massive currency devaluations that started the crisis had an almost immediate impact on the prices of goods and services with a high import content. Food prices rose more rapidly in most economies than non-food prices. Overall inflation occurred to a varying extent in the crisis affected economies depending on their monetary and fiscal policy responses. In certain cases, however, inflation was moderated by subsidies, price controls and additional importation. These notwithstanding, inflation not only eroded real incomes but also drastically reduced the real value of household savings. Higher prices and lower real wages effectively spread the cost of labor market adjustment over a broader population, beyond the unemployed workers.

Table 2: Annual Inflation Rate (%)

Year	Indonesia	Rep. of Korea	Malaysia	Philippines	Thailand
1995	8.6	4.5	3.4	8.0	5.8
1996	6.5	5.0	3.5	9.1	5.9
1997	11.1	4.4	2.7	6.0	5.6
1998	77.6	7.5	5.3	9.8	8.1
1999	2.0	0.8	2.8	6.6	0.3

Source: Data from individual APEC economies

In a paper prepared by the Asian Development Bank (ADB) focusing on four selected economies: Indonesia, Lao PDR, Thailand and the Philippines, all focused groups decried the sudden price escalation during the past year and a half, although in a number of cases, certain groups have benefited from the price rise. In Indonesia, there were sharp increases in the prices of daily necessities, such as food and transportation which drove many to make certain changes in their lifestyles. Fixed income groups like civil servants, private sector employees and factory workers were the most affected. Even worst affected were the informal sector workers. In the case of Indonesian farmers, higher prices for fertilizers and pesticides coupled with the El Nino drought led to a severe decline in production. Export crops, for example, copra, nuts and cocoa benefited from significant price increases but the advantages largely went to the plantation owners and not the plantation laborers. The income from fishing rose with significantly higher prices for fish, but as above, the owners of shrimp ponds and fishing boats got the windfall. Small fishermen complained of higher maintenance costs for boats and equipment.

In the case of the Philippines, 40% of community households were forced to reduce purchases of items that they would normally buy. This has been attributed to the high cost of farm inputs, the severe drought and the stranglehold on agricultural prices exerted by middlemen and traders. Many daily wage earners lost their jobs and replacement employment became scarce. The slowdown in real estate and construction, factory closures and business retrenchment led to higher unemployment rates among the urban poor and middle-income families. However, only a very few families interviewed, all of them urban, reported cutting down to two meals per day during the past year.

Nearly four-fifths of rural households surveyed in Thailand reported that 1998 was more difficult for them economically than 1997. More than half reported that their incomes had declined while about 40% cited a reduction in welfare benefits.

The latest report of the ADB, however, noted some encouraging signs that levels of poverty are starting to fall, albeit slowly, as the recovery gets underway Based on the latest survey of the SUSENAS of 10,000 families, poverty levels in 1999 have fallen back to almost pre-crisis levels. The sample size for the survey, however, was found to be too small to provide a conclusive result. More recent data from the affected economies is needed to do a better assessment. The fast recovery, is however, expected to have some positive impact on reducing poverty levels provided it is not associated with a greater inequality in the distribution of income.

A further indicator suggesting economic recovery in the affected economies is per capita real consumption, which has recovered a portion lost earlier during in the crisis years. However, compared to the peak of 1997, per capita real consumption in 1999 was still 4.8% lower in Indonesia, 4.3% lower in Korea, and 12.8% lower in Malaysia. For Thailand, per capita real household consumption peaked in 1996. In 1999, it was still 12.8% lower than the 1996 level. The only exception is the Philippines, which did not see a drop in per capita real household consumption during the crisis. However, if income distributions have become more unequal, and there is some evidence that this night be the case, then the consumption of the poorest may not be increasing or recovering as quickly as the economy-wide average.

Table 3: Per Capita Real Private Consumption Index
(1996 = 100)

Year	Indonesia	Rep. of Korea	Malaysia	Philippines	Thailand
1996	100.0	100.0	100.0	100.0	100.0
1997	105.1	102.6	101.9	102.6	97.7
1998	100.1	89.9	88.9	103.9	85.0
1999	100.0	98.1	89.1	104.4	87.1

Sources: Asia Recovery Information Center – ADB

Note: Private Consumption Expenditure at constant prices: Indonesia – 1993 prices; Malaysia – 1987 prices; Philippines – 1985 prices and Thailand - 1988 prices

All the data series have been indexed such that their 1996 values are equal to 100

For the Philippines, the World Bank used a separate section of the Annual Poverty Indicator Survey (APIS)[3] to analyze welfare change. Households were asked if they were adversely affected by the crisis in different ways. These include i) increasing prices of food and other basic commodities; ii) loss of job within the country; iii) loss of job due to retrenchment of migrant/overseas workers of the family; iv) reduced wages; and v) drought or "El Nino".

The results suggest that the impact of the crisis was modest relative to what has been estimated for other crisis-affected economies in the region, leading to a 5% reduction in average living standards and a 9% increase in poverty incidence, with higher increases indicated for the depth and severity of poverty. The measure on impact of overall inequality was minimal.[4]

The largest share of the overall impact on poverty is attributable to the El Nino shocks as opposed to shocks mediated through the labor market. Not all households were equally vulnerable to the crisis-induced shocks and the distributional impact of the two shocks was different: while the labor market shock was progressive (inequality reducing), the El Nino shock was regressive (inequality increasing). The impact of the El Nino was heavier on relatively poorer agriculture-based households whereas the financial crisis affected the relatively better-off wage earners more severely. In rural areas, the impact was felt on production shortfalls, to some extent increases in the relative price of food and increases in underemployment. In the urban areas, an increase in unemployment was observed indicating a slowing down of the economy as a result of the financial crisis.

It was further observed that the level of the shock increased with the level of commercial development of the community but the crisis dampened the positive effects of living standards of households social network (e.g., membership in cooperatives and NGOs) and community social capital (e.g., town hall, church, a park or library in the community). The occupational diversity within the household help mitigate the adverse impact of crisis-related shocks.

Despite the relatively small magnitude of the overall impact of the crisis, households tried to protect their consumption. For three- fourths of the affected households, consumption impacts were smaller than the income impacts; the median consumption impact was about one third lower, while the mean consumption impact was about four- fifths of the income impact. But the ability of the poor to protect consumption was more limited: the mean consumption to income shock ratio for the non-poor was 78% whereas it was 94% for the poor. The multiplicity of shocks reported by the household reflects both the

[3] The 1998 Annual Poverty Indicators Survey (APIS) conducted by the National Statistics Office was used to analyze the distributional impact of the crisis. While these data could in principle provide a direct measure of welfare change, the potential usefulness of the longitudinal nature of these data was seriously impaired by problems of comparability of income and consumption across two surveys – Family Income and Expenditure Survey and the APIS. The latter survey was designed to be a longitudinal survey forming a panel with the 1997 FIES. 23,150 households (59.8%) of the APIS sample were thus common to both surveys. It was virtually impossible to separate out how much of any observed decline in consumption or income would be attributable to a real crisis-related welfare shock versus how much is simply based on measurement.

[4] The WB notes that the results underestimate the full impact of the crisis to the extent they do not factor in the effects of the price shock reported by nearly 90 percent of the population. There is also the possibility of overestimation of the impact on account of potential measurement error in the self-reported shocks.

multidimensional nature of the crisis as well as multiple sources of income within the household.

The WB study noted that informal safety nets have their limitations and there is role for government in helping households cope with systemic shocks. While households may have benefited from private assistance, it is not possible to determine the extent of the contribution of private assistance or informal safety nets in mitigating the impact of the crisis on the poor. The WB suggests further study on this area particularly on understanding the insurance function of private transfers during systemic downturns.

2.4 Education and Human Capital

It appears that school enrollment has not substantially dropped as earlier feared due partly to timely intervention. Parents do not seem to be taking young children out of primary school in Indonesia and Thailand. The net primary enrollment rate in Indonesia was up slightly in 1998/99 (95%) compared to 1997/98 (94%).

The impact of the crisis, however, appears to be more pronounced on secondary school students(particularly girls and the poor) in all affected economies for which data is available. Drop out rates rose in the secondary levels in most economies, more so among boys than girls, in Thailand, Indonesia and the Philippines. Drop out rates in secondary levels in Indonesia increased from 4% in 1996/1997 to 12% in 1998/1999. The primary school drop out rate also rose from 3% to 6% in the same period. In Thailand, results of a survey of 121 lower and upper secondary schools revealed significant increases in school leavers[5] during the 1997/1998 and 1998/1999 school years. Males dominated the school leavers – about 60% – a share which has been fairly constant during the last three years. Increased numbers of transfers from private schools to public schools has also been reported. The inability of the parents to finance the education of their children because of high cost has led to an increase in demand for educational scholarships and safety nets.

While enrollment levels have not dropped, poorer families have had more difficulty in keeping their children in school. There also indications that tertiary level students choose to prolong their studies until labor market opportunities improve. Reyes et al (1999) noted that lower enrollment rates and higher drop out rates are most especially true in depressed communities such as the urban poor, sustenance farming, and upland and fishing communities in the Philippines. Among the reasons cited were financial difficulties, inability to cope with higher tuition fees and school expenses, higher transportation and school project costs, and similar expenses, and the need to give priority to more essential items such as food. The increase in drop out incidence was more particularly evident in public secondary schools and did not seem to be very large in elementary and private secondary schools. Reyes et al further noted lower growth in enrollment rate in both elementary and secondary schools for academic years 1997/98 and 1998/99 as compared to the historical average. The decline in enrollment in Grade I and first year of the secondary level indicated that families have postponed the enrollment of new entrants.

Further, studies have found that enrollment rates in all levels in the Philippines are both highly and positively correlated with per capita GNP and real educational expenditure of government. It was also revealed that college enrollment is positively correlated with the

[5] School leavers are those who drop out of school as well as those who transfer to other schools usually the public schools.

unemployment rate. This indicates that new graduates who cannot find jobs tend to return and continue with their studies.

The crisis has had a particularly sharp impact on tertiary education. Malaysian colleges and universities were forced to exceed normal enrollments (40,000) when as many as an estimated 54,000 Malaysian students studying abroad were forced to return home.

The rising cost of education has brought about the substitution of private education with public. This may be indicated by a decline in enrollment in private schools as in the case of the Philippines. In Indonesia and in the Philippines, parents with children in private schools have complained of higher tuition fees and expenses for uniforms, school supplies, food, transportation, and lodging for boarders.

Increased absenteeism and decreased participation in special school activities were also noted. Based on the focused discussion groups conducted on 57 communities in the Philippines, participants cited that absences led to poor grades and poorer quality education. Participants also reported that decreased income led sometimes to children skipping breakfast before going to school and their walking to school instead of using public transport – both of which contributed to a decline in children's interest in school.

A study of the Korean case indicated that the crisis has been associated with declines in kindergarten, primary and middle school enrollment but with increases in high school and tertiary school enrollment. The sharp decline in kindergarten enrollment rate (proportion of kindergarten enrollment to the kindergarten age group) from 39.9% in 1997 to 37.2% in 1998 may reflect not only a strong income effect (parents tend to regard kindergarten as luxury) but also decreased demand for childcare due to the decline in female employment. Lack of income has been cited as the more probable reason for the decline in enrollment rate in primary (from 98.6% to 98.3%) and middle schools (from 101.0% to 99.9%). In Korea, children are legally allowed to work before they reach the age of 15. Meanwhile, enrollment rates for the upper levels increased from 1997 to 1998, i.e., from 94.6% to 95.6% for high schools; from 68.8% to 74.3% for tertiary schools; from 81.4% to 83.9% for continuation from general high school to tertiary school; and from 29.2% to 35.7% for vocational high school to tertiary school. The study cited that the increases in enrollment probably reflect changes in private costs large enough to overcome the negative income effects, i.e., a decline in the opportunity cost of schooling (expected earnings) due to steep increases in unemployment among youth and sharp declines in real earnings. This would appear as a healthy response to the labor market effects of the crisis on the part of the youth. Well over half of all job losses occurred among the workers aged 15-29.

The impact of the crisis can also be gauged by the private cost of schooling, particularly in the secondary level. In Korea, data from a study conducted by the Korea Consumer Protection Board in 1999 (Moon, Lee and Yoo) indicated that private expenditure on tutoring declined by 24% during the crisis. The decline, however, was not evenly distributed with the lowest income group expenditure on private tutoring declining more than in the highest income group. This suggests a widening of the gap in human capital investment between the rich and the poor, with long-term implications for economic growth and equity.

Budget cuts in Thailand had an impact on two-thirds of the schools, eliminating milk programs and reducing purchases of teaching materials. Donations from parents and local communities also fell.

However, there is concern regarding the educational systems' capacity to expand access, maintain quality, and deliver efficient education services due to the higher costs following the crisis. Maintaining the quality of education both private and public is going to be a hard task as there are minimal resources available. Modernization programs for schools, such as the establishment of computer laboratories, have been put on hold. Likewise, cutbacks in the number of teachers will further erode educational standards.

2.5 Health and Nutrition

A study commissioned by the ADB to assess the impact of the financial crisis on selected Asian developing economies revealed that the more significant and evident impact of the crisis on the health sector, as perceived by focused group discussion respondents, was the reduced availability of medical supplies, vaccines and other health services such as immunization. The respondents complained of poorly maintained health facilities and suspended free health services. Large numbers of people have shifted to lower-cost, lower quality services in order to limit health expenditures.

Demand for publicly provided health services has increased but the public sector's ability to cope with this increased demand has been greatly constrained by the increased prices of imported drugs and the limited budget. Many Malaysians, for instance, have switched to government provided health services in response to the crisis leading to a sharp drop in the number of patients seen in private hospitals in 1998. Expectant mothers can no longer afford prenatal care. Common vaccinations are too costly, forcing households to stop vaccinating their children.

In Indonesia, the high costs of drugs and health services have been blamed for the deterioration of the populace's health. This is manifested in the dramatic decline in health care utilization rates. While 53% of those reporting an illness sought modern medical care in 1997, only 41% did so in 1998. Of those who sought medical care, only 20% went to public facilities and 24% to private facilities in 1998 compared to 27% and 28% in 1997, respectively. The incidence of malnutrition has been rising rapidly due to families' inability to buy food as prices more than doubled.

The reduction in health expenditures implies that certain government health programs such as immunization programs and preventive health services are at risk. Budget cuts in Thailand have forced the government to abandon some of their health programs such as the distribution of condoms and other contraceptives. Cuts in the public health sector budget also affected the medical expenses of civil servants.

It has also been observed that while a number of health care financing schemes (voluntary health insurance; mandatory programs like workers' compensation and social security; social welfare programs which help lower income groups, the elderly and other vulnerable groups; and fringe benefits covered by large private firms) are administered in Thailand, some people are covered by different programs while others receive no coverage at all. The World Bank estimated that some 23 million people (typically among the poorest in

society, slum dwellers, subsistence farmers and self-employed) are not covered by any of the schemes-

The Department of Health (DOH) in the Philippines estimated that as a result of the peso depreciation, the cost of imported vaccines will increase by between 31% and 44%, which translates to about 20.5 million less vaccines in 1998. Accordingly, there was a sharp contraction in the supply of drugs in the government health care system. The delivery of public health services was also adversely affected due to the delays in obligating previously allotted funds. The ratios for immunization, family health and maternal and child health services were all below 50%. Local government finances were also hard hit by the crisis as both the central government block grants and locally generated revenues declined. From a sample of 20 local government units, data indicated that per capita spending on maintenance and other operating expenses declined (Reyes et al 1999). This has adversely affected the availability of drugs in *barangay* health stations, rural health centers and national government hospitals devolved to local government units. Deterioration in the quality of government health services has been mentioned as one of the key effects of the crisis.

The increased incidence of poverty will lead to more malnutrition and higher vulnerability to disease in impoverished households. The crisis initially caused a general increase in prices and a decline in real incomes. These changes lowered the demand for food for all income groups, adversely affecting their nutritional status. A sustained shortfall of nutrients in the diet, especially protein, could cause an increase in the prevalence of malnutrition. In the Philippines, the onset of the crisis coupled with the El Nino phenomenon has caused malnutrition prevalence to go up to 9.2% in 1998. Prior to the crisis, the nutritional status of the Philippines had been improving. Over a period, malnutrition could drive down the average I.Q. level, thereby compromising the level and quality of human capital of a generation. The longer-term effects of the crisis on the health status of this vulnerable group, particularly infants and children, may only become apparent after a number of years.

2.6 Gender Dimensions

Discrimination and the prevailing biases against women have been demonstrated in the crisis' effects on them. It has already been noted that women are usually the first workers to be laid-off. Some opted for voluntary retirement anticipating lay-offs, in the case for instance of Korea. This is attributed to the fact that women workers have a lesser degree of unionization than their male counterparts. Also, firms would be able to save more if women are laid-off instead of men as women receive more benefits, such as maternity benefits, than men do. There is a general view in society that women are secondary income earners therefore making the decision to retrench them all the easier.

In Korea, the number of female employees hired on a regular basis dropped by nearly 20% compared to the 7.4% decrease for their male counterparts during the period October 1997 to October 1998. The number of females rehired under short-term contracts rose while the same figure fell for the males. Although school enrollment has not suffered, survey and anecdotal evidence indicate that households where women are primary income earners are more likely to pull their children out of school. Tutoring sessions for the daughters of Korean families were either stopped or reduced to free more resources for the education of their sons. By the second quarter of 1999, there have been improvements in the

employment and labor force participation rate of women given a reduction in the overall unemployment rate during the period from 6.2% during the last quarter of 1998 to 5.2% in the second quarter of 1999. The labor force participation rate increased from 47% to 48.1% during the same period. There has been evidence, however, that the heightened threat of layoff during the crisis has led to sexual harassment, and abuse in the workplace and that increased unemployment among female heads of household has been associated with particularly severe social impacts (e.g., increased juvenile delinquency, lower high school continuation rates).

Households in the region usually prefer to let boys go to school rather than girls especially during a crisis situation. Such is the case in Indonesia, where enrollment rates for girls in junior secondary school fell by 19.4% in 1998, whereas boys' enrollment rate dropped by 14.4%.

The crisis has reinforced women's proverbial " multiple burden" forcing more women to take on, in addition to the role wife/mother/homemaker, the role of secondary income earner (Reyes et al, 1999). Women had to stretch the household budget and seek the additional burden of taking on extra income opportunities as well as looking for access to credit sources to pay off previous loans. Some women sought employment in the informal sector by engaging in direct selling, ambulant peddling of fish, opening up sari-sari stores or accepting laundry work. Based on informant and focus groups interviews in Thailand, urban women, especially the heads of households without male support had to address their children's food, educational and other needs, virtually alone with extremely limited and irregular earnings. Women, particularly in Indonesia and Thailand, sought employment in areas traditionally reserved for men such as fishing.

Access to affordable family planning and reproductive health services, however, became more difficult. The ADB paper entitled "Social Consequences of the Financial Crisis in Asia, " (1999) noted budgetary cuts in four reproductive health programs in Thailand, including HIV/AIDS, maternal and child care health and nutrition, and family planning. One of the effects cited was a reduction in the distribution of condoms in brothels and other commercial sex establishments. In Indonesia, focus groups and key informants reported that up to two thirds of key assets in some villages changed the form of contraception from the favored but more expensive injection to the cheaper pills or implants if these were free. On the other hand, the increasing number of prostitutes in the region has raised the concern, particularly in health circles, that it might worsen the problem of prevention and control of the HIV virus.

The results drawn from the study of Balisacan and Edillon (1999) for the Philippines, however, show the different impact of age and previous unemployment spells for male and female workers. For workers employed prior to the crisis, the unemployment spells decrease with age although at some later stage these eventually rise. For female workers, the transition from falling to rising spells of unemployment tends to occur somewhat later than for male workers. This somewhat contradicts the common observation of female workers being driven out of work during an economic crisis. The study further indicated higher unemployment spells for female workers previously unemployed before the crisis than their male counterparts, regardless of age. But for male workers, unemployment spells increase directly with age. Work experience, especially for male workers is given a higher premium.

3. Measures to Address the Social Impact of the Crisis

As the impact of the crisis varies across economies, so do the responses thereto. Households employed varied and distinct coping mechanisms to respond to the crisis. These include adjustments in their consumption and saving, increased work effort, migration (domestic and international) to obtain higher–paying jobs and changes in the utilization of social services such as education and health care. Governments, on the other hand, implemented certain measures to establish social safety nets and assist displaced workers.

3.1 Government Response

Indonesia, Malaysia and the Philippines sought to stabilize food prices through various means. Indonesia imported and distributed rice and other basic commodities (fertilizer, livestock, feed) at subsidized prices and opted to ban exports of cooking oil which was eventually scrapped in favor of the imposition of an export levy. Exchange rate subsidies were likewise provided for some items like medicines and medical instruments. Price increases in response to higher inflation rates were postponed by the state-owned electrical utility, airline, water and telephone companies. Alternative distribution outlets were also encouraged. Local governments tried to control the price rise with no success.

The Philippines resorted to the selling of rice at discounted prices by the National Food Authority (NFA) rolling stores in targeted poor municipalities, and the establishment of "sari-sari" stores that would sell basic commodities at lower prices. Rice discount cards were also distributed to poor families with large number of children entitling them to rice at P 2.50 per kilo. Subsidies were also provided for the purchase of iron-fortified rice in areas where there is a significant degree of iron deficiency. Energy price hikes were also postponed.

In Malaysia, prices are administered for a number of commodities. Of the 46 items covered under the Supply Control Regulations, supplies of 21 items are monitored all year-round while the remaining items are monitored during festival seasons. From among the 21 items, prices of 11 items are administered. These are sugar, wheat, flour, sweetened condensed milk, standard loaf of bread, cooking oil, round steel bars, cement, petrol, and liquid propane gas (LPG). Only LPG is subsidized. Exporting certain food items has also been banned. Since mid-1998, foreigners have been prohibited from taking cooking oil, sugar, sweetened and condensed milk and flour out of Malaysia.

Fuel and transportation were also subsidized in several economies. These short-term measures could have provided some relief to poor households, but they appeared not to be carefully targeted. Attempts to subsidize goods or even the ban on exports led to reselling at higher prices and smuggling in the case of Indonesia. Low quality rice sold at prices lower than the prevailing market levels failed to attract consumers. The impact thus may not necessarily be that significant.

A number of governments also considered repatriating foreign workers hoping to free up jobs for their own nationals. Malaysia, Thailand and South Korea attempted this, but as mentioned earlier, their own citizens were unwilling to take jobs vacated by the immigrant workers, (e.g. plantation work in Malaysia and construction in Thailand and Korea).

Most governments have aimed to maintain education and health budgets in real terms in order to protect longer-term human development goals. In addition, efforts have been made to institute or expand programs that target poor households or regions through such mechanisms as low income health cards, school cards and student loans to primary and secondary schools. These programs appear to have worked well but remain vulnerable to leakage to the non-poor and to excluding some of the vulnerable.

The Malaysian and Indonesian governments maintained budget allocations for public health to ensure availability of essential drugs and vaccines needed for communicable disease control, contraceptives and food supplements for pregnant women, basic health services, particularly health programs. Indonesia also provided additional funding for drug and vaccine quality control, hospital and health center laboratory work, and equipment to sustain emergency room services. With regard to the Philippines, the budget allocation for health declined in real terms in 1998.

Governments of affected economies also utilized innovative ways to cope with declining budgets. In Thailand, before safety net funds became available, health facilities reduced the amount and variety of drugs offered to patients, giving them only small amounts of medicines. While Thailand managed to protect the health sector from overall cuts in government expenditure, some programs have been cut back (notably an NGO grant program for AIDS treatment) while others have been under pressure, i.e., those involving the import of drugs and equipment from western economies. Per capital budget support has also declined due to increased utilization.

Indonesia, Thailand, Korea and the Philippines (on a limited scale) successfully used public works programs to provide temporary relief to the unemployed. In the case of the Philippines, the World Bank finds merit in capitalizing on the use of public works and workfare programs as part of the country's permanent safety net. Indonesia has developed large programs of labor-intensive public works to help cope with unemployment during the crisis. For 1998/99, these programs were budgeted at $2 billion and were expected to generate 2 million jobs. It has been estimated that it costs about $4 to $5 to transfer $1 to the poor through the Indonesian public employment programs compared to almost $8 when untargeted cash transfers are used (Attinc and Walton 1998).

In May 1998 the Korean government also introduced a temporary public works program (that enrolled 76,000 workers) as well as a new temporary livelihood program for which the newly unemployed could qualify. By January 1999, the program was providing 437,000 jobs although the number of applicants was still higher at 650,000. The allocation to the livelihood program has been expanded to cover 750,000 beneficiaries.

An earlier study on the Philippines public works and food for work schemes, suggested problems with targeting on account of higher-than-market wages and inadequate maintenance of assets creates concern with the type of works that are technically amenable to labor based methods, incentive issues with use of contractors and inadequate monitoring and evaluation. Further, a number of public works programs in these economies have suffered from design and management problems, leading to problems such as low take up by the vulnerable and ghost workers.

Job retraining programs were also used, providing for partial compensation to provide temporary support to workers who had lost their jobs. While Korea has extensive vocational and employment services networks, its resources and institutional capabilities, however, were inadequate to meet the massive requirements of the crisis. The government job placement system was designed to handle about 300,000 unemployed workers as compared to the 1.5 million it had to deal with during the crisis (ILO 1998). Korea has also developed a job creation program of start-up loans for unemployed professionals and managers to help them set up their own ventures, and loan programs to improve working conditions in occupations in which foreigners hold many jobs, and thereby encourage Koreans to take such jobs. Malaysia created several funds designed to expand employment during the crisis.[6]

In the Philippines, the Department of Labor and Employment (DOLE) was instructed by the Economic Summit to assist displaced workers and affected overseas workers (Illo 1998). The DOLE assistance package includes provision for monitoring job losses, labor displacement, and job creation, grants for displaced workers, assistance in finding new jobs and a program of dialogue and symposia to promote better industrial relations while improving productivity. Social security funds in the amount of P 300 million have also been used to fund a program of low-interest loans for the retraining of unemployed workers (Lim 1998). The Philippine government was also able to persuade management to allow adjustments in real wages to control labor costs rather than resorting to lay-offs.

Labor and management have also worked together to minimize the social impact of the crisis. DOLE together with labor and employers' groups worked out an accord .in February and March 1998 to avoid lay-offs and strikes. The accord commits the employers to exercise restraint in the lay-off, termination and rotation of their employees, while labor commits to exercise utmost restraint in declaring or holding strikes, 'slowdowns', or other forms of work stoppages. Korea carried out consultations on labor-management issues after the establishment of a tripartite labor-employer-government commission. In a survey of 400 enterprises conducted by the Federation of Korean Trade Unions, it was found that 52% of firms surveyed had imposed a freeze on new recruitment; 17% had used early retirement; and 14% had used reductions in the number of hours worked. In Malaysia, many employers have implemented alternative measures such as pay cuts and temporary and voluntary lay-offs before resorting to permanent lay-offs. It has been observed, however, that in these economies, there has been little progress in modernizing worker-management relations in order to allow workers to air grievances and resolve disputes.

The absence of formal social safety nets in most of the economies was a real cause of concern. Social security and pension systems, medical or health insurance and educational loan systems in these economies were observed to be weak or non-existent when the crisis broke out. In Indonesia, Thailand and the Philippines, workers have to rely on their own resources or their families as they become unemployed.

[6] These include: a) RM 300 million fund providing low interest loans to farmers and Farmers' Association; b) RM 100 million providing loans to hard-core poor for income generating activities in rural areas; c) RM 100 million (Small Scale Entrepreneur Fund) and RM 150 million (Economic Business Group Fund) providing microcredit to petty traders, hawkers, and small entrepreneurs including, women entrepreneurs in urban areas; d) RM 1 billion assisting companies involved in manufacturing for export; and e) RM 300 million providing assistance to students in local institutes of higher learning.

Among the most affected economies, only Korea has a formal unemployment insurance scheme and even in that case, coverage was limited when the crisis began. However, in January 1998, the Korean unemployment insurance scheme was expanded to include virtually all enterprises other than small businesses based on self-employment, with the benefits of the scheme also upgraded. The number of firms covered under the scheme quickly rose to more than 309,000 in 1998 from 47,000 firms in 1997. As of January 1999, worker contributions increased from 1.5% of total gross wages to 3%. By November 1998, more than 441,000 persons were receiving unemployment benefit at roughly $1,500 per month per beneficiary. It has been noted, however, that the benefits of the current unemployment insurance scheme begin to be phased out after about nine months and there is a risk that those unemployed for a longer period may not be adequately provided for.

Thailand launched a Center for Assistance to Laid-off Workers in August 1997, providing assistance to laid-off workers with severance pay, social security cards, job placement and counseling, training courses and low interest loans. The Ccnter is linked with the Department of Employment's Bangkok and provincial offices. Several job fairs, an employment website and mobile counseling and training units have been sponsored by the Ministry of Labour and Social Welfare. Loans were also provided to the unemployed for purposes of starting small businesses. The Government of Thailand also announced plans to spend significant additional resources to boost demand and create jobs. Translating higher allocations into effective programs has proven to be a challenge for some economies on account of the limited number of programs to expand.

Over the last year, governments have moved further to protect, and often increase, social budgets. Except for the Philippines and Malaysia, the share of government expenditures on social safety nets and welfare in the total budget increased in 1999 to address the social issues arising from the crisis. From among the crisis affected economies, Korea has the highest social safety net expenditure. The Korean government more than tripled its expenditures on social protection – from 0.6% of GDP in 1997 to 2.6% of GDP in 1999, Most of the incremental outlays funded expansion of diverse income maintenance programs including unemployment insurance, public works, livelihood and assistance to women. Social safety net programs in other economies cover only basic social welfare and, in the case of Malaysia, housing.

Table 4: Central Government Expenditure on Social Safety Nets

Year	Indonesia	Rep. of Korea	Malaysia	Philippines	Thailand
1996			4.3	2.4	4.6
1997			5.0	4.1	4.9
1998	1.6	7.5	4.9	4.2	4.1
1999	2.2	9.4	4.7	4.1	4.4
2000		7.7		4.2	

Sources: Asia Recovery Information Center - ADB

A means needy pension has also been introduced in Korea for some 660,000 needy elderly. In August 1999, the National Assembly passed the National Basic Guarantee Act which is expected to be in force in October 2000. Said law entitles all Koreans below the poverty line to receive income support from the government. Women workers are expected to benefit from the expansion of unemployment insurance to businesses with five or less people, since these firms employ 80% of the total female workforce. A special Window for Reporting Dismissal of Women has also been created in the Ministry of Labor. Assistance to firms who hire unemployed women who are heads of households is also to be extended through training programs, public works projects and wage subsidies. Reform of the national pension scheme and the medical insurance system is also being planned.

In some economies, private companies are required to provide lump sum retirement or severance pay to employees that are permanently laid–off. Payment thereof is mandatory in Japan. In the case of Korea, the government itself paid the compensation when bankruptcy prevented the firms from paying these benefits. Severance pay and limited security benefits, however, have not always been paid in Thailand. In 1998 alone, 22,776 cases brought by laborers have been reported.

Safety nets, however, do not come without problems. Observations tend to point out inefficiencies in administration and relatively high levels of corruption leading to beneficiaries other than the targeted group (Pasadilla, 1998).

Civil society organizations including the private/business sector and NGOs, have played an increasingly important role in a number of economies in their response to the crisis. Governments and donors have increasingly worked with civil society organizations in drought and crisis relief operations and in implementing and monitoring various initiatives including HIV/AIDs prevention and treatment, small and medium-sized enterprise development, environmental protection and various initiatives funded through social community funds and government organizations. Direct community involvement in project selection and implementation has been shown to increase program benefits in the crisis in a number of affected economies and thus is being encouraged.

While measures were focused mainly on the implementation of safety nets, there was the recognition that the impact of the crisis would have its impact well beyond the short-term period. For the medium-term, the Indonesian government will examine the sustainability of the current health service delivery systems, evaluate the competitiveness of pharmaceutical/vaccine production and develop a strategy to extend pre-paid health finance mechanisms. In addition to strengthening safety nets and protection of public expenditures in the social sectors, the Malaysian government will review the implementation of the Seventh Plan on health services with the end-in-view of improving delivery of basic health care services. The Philippines, meanwhile, has articulated in its medium-term strategy for 1998-2004 the promotion of equity of access to health services, responsive and effective health interventions and improvement of the DOH institutional capacity, as well as efficiency of local health delivery systems and promotion of sustainable health financing schemes. The DOH is also expanding assistance to devolved and private hospitals and establishing a financing facility for hospital infrastructure.

3.2 Multilateral, Regional and Bilateral Assistance and Initiatives

Governments of affected economies obtained loans from multilateral financing institutions to stem the adverse social effects of the crisis. The ADB provided: quick disbursing budgetary support to Korea to mitigate the adverse social effects of the crisis; US$300 million for Indonesia as program support for social protection of the poor focused on essential education and health services, an additional US$300 million for follow-up program support for health and nutrition, and US$320 million for program support for income generating activities, community development and decentralization of government functions.

The ADB also commissioned the provision of financed technical assistance studies that examined options for supporting the social sectors in Thailand, Indonesia and the Philippines. Further, it designed social protection programs for Indonesia and Thailand targeted to assist the groups most affected by the crisis. Detailed technical assistance packages to the governments accompanied the funding in order to help ensure effective use of the loans.

In Indonesia, the WB in coordination with other donors has continued to provide direct support to the social safety net and key social services. A new project to support employment and income generating activities in the poorer urban communities of Java – the Urban Poverty Project – has been declared effective. The portfolio also includes the "stay at school" project for scholarships, and block grants for primary schools in coordination with the ADB and several projects in the health sector. In partnership with AusAID and the Government of Indonesia, the WB is conducting work on Education Strategy Development and continues to support structural poverty reduction through the Kecamatan Development Project and the Village Infrastructure program. A series of working papers on the social impact of the economic crisis have been produced by the Social Monitoring and Early Response Unit of the Bank which was set up with support from the WB, AusAID and ASEM (Asia-Europe Meeting) trust funds. However, pending the resolution of the Bank of Bali issue, all fast disbursing budgetary support including the Social Safety Net Adjustment Loan is on hold. These funds include $859 million in approved funds and $900 million in new funds to be approved during the first half of 2000 (WB Sectoral Update 1999).

In the case of Malaysia, the World Bank has approved a $300 million Social Sector Support Project loan. This will assist the Malaysian government to alleviate the adverse impact of the crisis on the poor and vulnerable through maintaining their welfare and access to essential social services particularly those living in the poorest districts. The Education Sector Support Project provides funding to continue core programs in basic education and support polytechnic education to provide skilled technicians for the medium-term economic recovery; and achieve efficiency improvements.

Thailand secured loans from the ADB and the WB, including OECF amounting to $500 million and $394 million to finance its Social Sector Program Loan and Social Investment Project, respectively. These projects will cover labor market and social welfare, and health and education, respectively. In the case of the latter project, significant progress in implementation has been achieved on small-scale civil works, the participation in training programs of over 53,000 people as well as the new Social Investment Fund's new social assistance window. The WB financed Public Sector Reform Loan includes components for

education and health reforms as well as governance focusing on decentralized service management to local "boards", and new budgeting reforms to allow more flexibility in the allocation of resources.

The WB has also actively supported social restructuring and improved governance in Korea through the Economic Reconstruction Loan which has addressed social sector reforms in labor markets, anti-poverty programs, health insurance, pension sector reforms; and Trust Funds. The ASEM grants support to government implementation of social sector reforms in the areas of social protection for workers, protecting the poor and the elderly. A recent ASEM grant will support an assessment of the type and scope of problems affecting women and families after the crisis and the development of policy recommendations for incorporating counseling services into the routine health care delivery system.

In June 2000, the World Bank and the Government of Japan announced the launch of the Japan Social Development Fund (JSDF). Financed by a Japanese government contribution of 10 billion yen (approximately US$95 million) and administered by the World Bank, this new facility is intended to alleviate the damaging social consequences of the 1997-99 financial crisis.

The JSDF will provide grants in eligible economies to support activities which directly respond to the needs of the poor and vulnerable groups, enhance their capacities and strengthen their empowerment and participation in the development process.

The Japanese Government has established a similar program at the Asian Development Bank – the Japan Fund for Poverty Reduction. This will support on a grant basis the ADB Poverty Reduction Strategy which was approved in November 1999.

The United Nations International Children's Emergency Fund (UNICEF) has provided a number of social programs to mitigate the impact of the crisis in Indonesia, Thailand and the Philippines. In Indonesia, a new Rapid Response Complementary Feeding Programme provided low cost complementary food for infants in selected provinces while a national social mobilization campaign was launched to keep children at school. UNICEF, United Nations Development Program (UNDP) and World Food Program (WFP) are cooperating on ways to provide emergency assistance to vulnerable groups. Support was extended to the Indonesian government to help monitor the effects of the crisis including reactivating an early food security monitoring system at district level, refocusing of the 100-village sentinel site surveillance and setting up an emergency crisis "hot-line" information system.

In Thailand, UNICEF and the Royal Thai Government adopted a new country programme for 1999-2003 designed to address the problems that have emerged from the crisis. A rapid data collection exercise as well as a "20/20" study on budget allocations were undertaken during the course of 1998, the findings of which helped better define programme responses to the crisis with focus on the poorest families. UNICEF collaborated with the World Bank and the UNDP in the design and implementation of the Social Investment Programme.

In the Philippines, UNICEF has provided emergency assistance to 4,800 families in the four provinces of Mindanao that have been seriously affected by drought and by the economic crisis. The package includes rice, corn seeds, gardening tools, medicines, vitamins and school supplies. UNICEF also provided additional support for programmes

for vulnerable groups of children who need health, nutrition, education and psychosocial services. UNICEF is cooperating/coordinating with the government, other UN agencies and donors within the United Nations Development Assistance Framework on the channeling of emergency assistance to target groups; on carrying out studies on the effects of the crisis; and on identifying specific activities for more intensive and orchestrated programme assistance for school children, working children, and the children of indigenous communities.

In response to the crisis, a Task Force on ASEAN Safety Nets was officially established in December 1998. Its aim is to develop and implement an action plan to ameliorate the impact of the crisis and build capacity in participating economies in terms of assessing and monitoring the social and economic impact of the crisis, identifying the target groups affected and their needs, developing and implementing social safety net programmes for the disadvantaged and vulnerable, monitoring and improving the effectiveness of economic and social services delivery, and promoting public awareness of the impact of the crisis particularly on the poor. The World Bank and the Asian Development Bank, among others, were requested to assist the Association of Southeast Asian Nations (ASEAN) economies in implementing the action plan. At the July 1999 ASEAN Post-Ministerial Conference, Australia announced funding of A$500,000 for two projects under the ASEAN Action Plan on Social Safety Nets to improve analysis of social impacts of economic shocks and the design of safety net programs.

Australia has likewise provided assistance to mitigate the impact of the crisis to affected economies. Humanitarian assistance to Indonesia alone now totals more than A$60 million, the core element of which is a commitment of around A$30 million in food aid, commodities and other assistance through the World Food Program. In the Philippines, Australia is establishing a A$30 million Vulnerable Groups Facility over a five-year period to provide targeted support to essential Philippine government programs for those groups most seriously affected by the crisis, structural reform and the El Niño/La Niña weather patterns.

In addition to assistance on an economy level, Australia implemented important regional initiatives in response to the crisis. In 1998, Australia announced a three-year, A$50 million Economic and Financial Management Initiative to assist Asia-Pacific Economic Cooperation (APEC) developing economies. The initiative targets priority economic governance needs with the aim of restoring sustained growth in the region. Implementation of the initiative is now well underway, with over A$40 million of activities completed or in progress. Likewise, Australia's Asia Crisis Fund was established in the same year. This fund allows for flexible and prompt responses to key technical and capacity building needs in both economic governance and social areas. In recognition of its effectiveness, the fund was doubled to A$12 million for 1999-2000.

In line with the Leaders' decision to increase APEC's attention to social safety net issues, Australia commissioned a team of experts to undertake a survey on the impact of the Asia Crisis on children and its implications, for the design and implementation of social safety nets. The final report: "Impact of the Asian Crisis on Children: Issues for Social Safety Nets" examines the impact that the crisis has had on children in Indonesia, Thailand and the Philippines. It provides a stock take of responses to the social impacts of the crisis undertaken in each economy and identifies areas where further work would be most beneficial. To address the major issues identified in the report, Australia announced a

three-year, A$5 million Social Protection Facility for East Asia. This is directed at providing APEC developing economies with a flexible mechanism for the development of social policy and delivery programs. Thailand has proposed that the Fund be used as seed money for the establishment of a Social Infrastructure Facility to be administered by the World Bank.

With funding from the AusAID, the Asia Recovery Center (ARIC) at the ADB was established in 1999. An Internet-based facility, it gathers, collates and disseminates information on the economic and social impacts of the crisis and how the recovery is progressing to help decision makers decide how best to respond to the crisis.

USAID's response has been through the Accelerating Economic Recovery in Asia (AERA) initiative. Targeting the most affected economies and focusing on both short-term relief and longer-term recovery efforts, AERA concentrates on four key areas, namely: creating jobs by making available working capital to small and medium-sized enterprises through the Micro- and Small Enterprise Development program and provision of loan guarantees to small businesses as well as technical assistance to banks to deal with credit and other business issues; strengthening the foundations for economic recovery through capacity building and improvement in governance; improving social safety net investments by giving high priority to information system for tracking and targeting social safety investments; and promoting regional perspectives through regional institutions.

4. Policy Options and Development Strategies and Conclusion

Most of the social impacts highlighted were, in fact, long standing problems that were simply aggravated by the crisis. This has made quantifying the exact impact of the crisis difficult. It is, however, recognized that confronting the immediate social fallout of the crisis is crucial. Moreover, it is equally important to shape the responses in the context of longer-term development challenges.

Direct public action through various forms of safety nets especially using public resources was utilized to both reduce income losses due to employment declines and price increases, and to reduce the risk of irreversible losses in human capability resulting from lost education and malnutrition. Public safety nets, however, have been constrained by fiscal retrenchment and associated institutional weaknesses. Most of the affected economies have only limited safety nets. These notwithstanding, the existing safety nets consisted of a wide range of measures. The breadth of regional experience provides the opportunity for the affected economies to determine what works or does not work for them.

Distributional effects of both the shocks and economy-wide responses, vary between rich and poor, across different socio-economic groups, and between men, women and children. Various mechanisms have been employed by households to cope with the crisis. Some of these are relatively harmless and pose little risk to the future welfare of the population concerned such as working longer hours and substituting cheaper foods for more expensive foods. Others shifted the impact of the crisis into the future, for instance by delaying medical care, selling productive assets and withdrawing children from school. Having few and limited coping options, the poor use those which tend to be more harmful than those used by upper and middle income groups.

The crisis also brought to attention the adverse consequences for the social fabric as a result of economic declines and cutbacks in social services. Human deprivation can spark domestic violence and crime. This points to the need to focus assistance to those who can least cope with the adverse effects of the crisis, particularly the poor. Improving their well-being is central to containing the adverse impact of the crisis and preventing its recurrence. More importantly, reducing human deprivation is essential in attaining sustained socio-economic development.

A mix of interventions may also be adopted to manage the risks for communities and households. The type of intervention will depend on the kind of risk and institutional capacity of the economy. For example, microinsurance programs can complement the microcredit programs for poor women built around their organizations. Public works programs can be expanded in response to local or national shocks. The food transfer programs and social funds to help finance projects identified by communities can also be effective in coping with disaster.

The World Development Report 2000/2001 cited that economy shocks are often hardest for the poor to cope with, especially when these are repeated, deep or persistent. These shocks can be managed by having sound macroeconomic policies and robust financial systems. But for the poor to cope it is essential that public spending on important programs, including the provision of social and economic services and infrastructure, is ensured and that this does not fall during a recession, especially relative to a rising need. This can be done through a well focused targeting mechanism and the implementation of projects which are foreseen to have immediate or significant impacts. Making the state and social institutions more responsive is key in reducing vulnerability to risks and helping affected people cope with adverse shocks.

The WDR further stressed that, more than short-term responses to the crisis, there is need to attack the incidence of poverty which has pervaded developing economies to ensure long-term growth. The report cited that poor people have been vulnerable to internal and external shocks because they have meager assets, markets are inaccessible to them and job opportunities are scarce.

Market reforms can be central in expanding job and income opportunities. However, these reforms need to reflect local, institutional and structural conditions. Making use of international trade and long-term direct investments can bring in positive long-term externalities in terms of market expansion and knowledge transfer. Opening to trade, however, needs to be well designed. A more pro-poor liberalization is not necessarily a slower one; moving fast can create more opportunities for the poor (WDR 2000/1). Job and income opportunities can be further promoted through increased private/business sector investments and a sound business environment particularly for small firms. Private/business sector investment will have to be complemented by public sector investment including infrastructure and communications and upgrading the skills of the labor force, to enhance competitiveness and to create new market opportunities Sound and responsive institutions are not only important, they are fundamental in the overall growth process and in addressing the needs of poor people.

Lessons from the Latin American experience point to the relationship between political structures and effective reforms. Some of the contributing factors to the crisis in terms of

lack of transparency, corruption, cronyism, etc., point to the need for a fundamental opening of decision making in economic policies (WDR).

Decentralization can also bring service agencies closer to poor communities and individuals, potentially enhancing people's control of the services to which they are entitled. This will require the strengthening of local capacity and devolution of financial resources. Decentralization further needs to be combined with effective mechanisms for popular participation and the monitoring by citizens of government agencies.

Engagement with civil society organizations also needs to be deepened and expanded at the center of addressing the social and economic costs. This includes project implementation and research on social costs, but is wider and deeper in terms of finding new ways of bringing diverse parts of civil society into determining responses to the crisis.

Also important is the removal of social and institutional barriers that result from distinction of gender, ethnicity and social status. Actions will also be needed to strengthen the capacity to influence policy at the state and national levels such as by linking local organizations to wider organizations.

While domestic action is critical, global development exerts a potent influence on processes of change at national and local levels. The action of developed economies and multilateral organizations will be crucial to spur economic growth and reduce income inequality. Actions by the international community and in development cooperation will continue to be essential in maintaining financial stability, increasing the capacity of developing economies' health delivery systems, improving agricultural research and opening international trade opportunities for developing economies.

Lastly, consistent with the shift of development cooperation from aid to trade, developed economies could expand opportunities by opening their markets more completely to imports from poor economies, especially in agricultural products, labor-intensive manufactures and services.

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APPENDIX

PART I. Main Report, Paper from *APEC Economies beyond the Asian Crisis: A Progress Report,* September 1999

I. Introduction

Economic Committee takes on a major research on the crisis

The Asian financial and economic crisis has had wide-ranging, far-reaching impacts on APEC member economies in Asia and beyond. The crisis has been a central concern for the APEC community since its onset. It topped the agenda for the Leaders' and Ministers' meetings at Kuala Lumpur. Shaping a credible APEC response to the crisis is a major strategic objective for the 1999 APEC.

To address this central concern for APEC, the Economic Committee has been undertaking a research project focusing on long-term implications of the crisis. This research project, titled "*APEC Economies beyond the Asian Crisis*", is a two-year endeavor which started in early 1999. The project aims to highlight the factors shaping the future of APEC member economies, and outline likely scenarios for growth. Broad directions of policies to achieve sustainable growth and equitable development are to be suggested. Thus, this project is forward-looking, rather than focusing on postmortems on the crisis (i.e. why the crisis happened etc.).

The issues to be addressed in this project are wide-ranging. The research work is being carried out as a collaborative effort led by several lead economies including Japan (growth potential), Korea (trade and investment), Chinese Taipei (small- and medium-sized enterprises: SMEs), and the Philippines (social impacts and policies).

This progress report is prepared, as an early result, for the Ministers' and Leaders' Meetings in Auckland in September 1999. The final report will be delivered to the Brunei meetings in November 2000. As part of the implementation of the project, a major symposium will be held to discuss the project's research outputs and mobilize various view and perspectives in Tokyo in December 1999. Wide participation will be sought from APEC member governments, academia, major international organizations, journalism, and business.

Value-added for APEC

There is an emerging body of studies on issues concerning the crisis undertaken by multilateral institutions such as the IMF and the World Bank, academics, and business economists. What value does this research project add for APEC?

1) It fosters a sense of direction within the APEC community
An important value added of this project for APEC is to provide a vehicle for the APEC community to foster a sense of direction on the prospects of APEC economies and necessary policy actions. This project highlights some key structural issues the crisis has shed light on, and undertakes long-term projections of economic growth and trade and investment in the APEC region, taking into account long-term implications of the crisis.

2) It helps develop APEC responses to the challenge of regaining growth
Another value added of the project is to provide the analytical basis useful for refocusing and strengthening APEC cooperation activities. This project aims to suggest a broad policy directions for APEC cooperation, with the view to regaining robust growth over the long term.

II. Where Do We Stand in Understanding the Crisis?

The growing body of studies concerning the Asian crisis has largely focused on three areas; (1) the causes of the crisis (why the crisis happened), (2) crisis resolution (how best to resolve crises, including the appropriate role and policies of the IMF), and (3) crisis prevention (how best to prevent future crises). The three areas are interrelated, and in particular, prescriptions for crisis resolution and prevention rest in large part on the diagnosis on the causes of the crisis.

Two views on the crisis

There have long been two strands of thought on the causes of financial crises. One view holds that financial crises are self-fulfilling panics caused by the inherent instability of international financial markets, even if an economy maintains more or less sound economic fundamentals. The other view holds that a crisis is home-grown in the sense that the crisis-hit economy has its own problems such as imprudent economic policies, and that international financial markets are simply providing a necessary discipline. It is important to note that both views are consistent with capital flows providing important benefits in terms of an improved allocation of resources over time and across activities.

As with the previous crises, both strands of thought appear in discussion of the causes of the Asian crisis. Of course, few serious economists would contend that either view applies in a pure form, and there are views in between. The "panic" camp agrees that the crisis-hit Asian economies had serious problems such as under-regulated banking sectors, overvalued exchange rates, and real estate bubbles in the run-up to the crisis. However, the "panic" camp considers that such problems were not serious enough to warrant the onset of the crisis. In the similar vein, the "home-grown" camp acknowledges that there was an element of a financial panic in the Asian crisis, even though it was the underlying vulnerabilities of the crisis-hit economies that invited the crisis. The "home-grown" camp also considers that, due to panicked withdrawals of capital, the devastation of the crisis may have gone far beyond what could be attributed to underlying problems.

Different diagnoses may lead to different prescriptions for crisis resolution and prevention, at least assigning different weights to necessary measures. For example, if the Asian crisis was all about a self-fulfilling panic, then the most needed measures to rescue the crisis-hit economies might be the provision of prompt and sufficient liquidity rather than the tightening of fiscal and monetary policies and structural reforms. Effective measures to prevent future crises should be of a financial nature such as limiting short-term capital inflows and increasing foreign currency reserves (particularly in relation to short-term capital inflows). On the other hand, if the Asian crisis was home-grown, then resolute structural reforms need to be part of crisis resolution measures because they would help restore investor confidence. Such reforms should also be effective in warding off future crises.

Broad common understanding

These issues have not as yet been settled, and more research is needed to improve our understanding of the nature of the Asian crisis and ways to prevent similar crises in the future. However, it would not be premature to say that there has emerged some broad common understanding on what happened in East Asia in 1997. That is, volatility of capital flows, particularly short-term capital flows, played an important role in the Asian crisis

(whether that was a primary or ancillary role remains unresolved). There were also problems in such areas as financial sectors and exchange rate policy, which had made East Asian economies vulnerable to a crisis.

III. A New Way of Looking at the Crisis: Perspective of Maximizing Growth Potentials

The crisis has shed light on structural weaknesses

As mentioned earlier, there has been a growing body of studies focusing on the causes of the crisis, crisis resolution and prevention. The main motivation of those studies is our desire to minimize the devastation of the crisis this time and ward off devastation in the future.

There is another important angle from which to look at issues arising from the crisis. That angle is to look into structural weaknesses that the crisis has shed light on in a rather stark manner. Its underlying motivation is to maximizing long-term growth potential. As it will be shown later, looking at the crisis from this angle opens the way for APEC to refocus and strengthen its cooperation.

Such structural weaknesses in Asian economies had been spawned over time by spectacular growth and built up under the surface of booming economies. Even if one believed the polar view that financial panic, rather than fundamental weaknesses, was the root cause of the crisis, there would be no denying that long-term growth prospects hinge on how structural weaknesses highlighted by the crisis are addressed.

For example, the crisis has shed light on under-regulated financial sectors and weak corporate governance as important weaknesses in the crisis-hit economies. It is clear that the failure to strengthen the financial sector and corporate governance would lower growth potential over time. Another example is weaknesses in social safety provision that have been revealed by serious social impacts of the crisis on the crisis-hit economies. Underdeveloped and often-neglected social safety nets certainly did not cause the crisis, but it is now clear that sustainable, equitable growth over time would not be possible without addressing this revealed structural weakness.

Structural problems inhibit future growth

Future growth potential in Asia would be constrained by structural weaknesses that had been largely masked in the recent past but sharply revealed by the crisis. In order to secure sustainable growth over the long term, it is very important to identify such structural weaknesses and then address them head on. The Asian crisis has brought on devastation to the region, but it may be a blessing to the extent that it has fleshed out the economies' weaknesses to be redressed. Until recently, we might have been cavalier about them, dazzled by glaring records of strong growth. Since early 1999, there have been some encouraging signs that recovery is taking hold in Asian economies, but it is important that we should not become complacent in order to ensure that these weaknesses are addressed fully.

Box 1: Was the Asian miracle a myth after all? Or was the crisis only a hiccup?

In order to envision the future course of Asian economies, it is important to assess the crisis in the context of long-term growth. The above argument maintains that long-term growth of Asian economies would be inhibited unless structural weaknesses highlighted by the crisis are redressed, although the extent to which such structural weaknesses contributed to causing the crisis remains unresolved among researchers.

In this context, it is worth examining an often-asked question of whether Asian economies hit the wall because the Asian miracle was a myth or mirage after all, as Paul Krugman of MIT suggested earlier in his controversial paper. (Paul Krugman, "The Myth of Asia's Miracle", Foreign Affairs, November/December 1994.) If that is the case, we would have to expect a significant deceleration in growth in the long-run in Asia. An opposing view would hold that the crisis was only a hiccup (or temporary setback) for potentially strong economies, due to such reasons as whimsical capital movements. If that is the case, the economies could eventually return to the same growth trajectory as before after a few years of adjustment.

There appears little basis for claiming that Asian economies hit a wall because the Asian miracle was a myth. The thrust of Krugman's argument was two-fold. First, the growth pattern of East Asian economies were surprisingly similar to that of the Soviet economy in its high growth period of the 1950s, in that both economies achieved rapid growth by massively mobilizing capital and labor inputs ("input-driven growth"), rather than by increasing production efficiency. Second, input-driven growth would not be sustained as the law of diminishing returns sets in. What his argument implies for the region's growth prospects is that Asian economies would likely experience a gradual slowdown in growth, but not an abrupt, drastic downturn in growth. While the causes of the Asian crisis have been much debated, the issue of "input-driven growth" has not been discussed as a cause of the crisis in the controversy. In fact, Krugman himself concedes that he did not predict the crisis.

It would seem unlikely, however, that Asian economies would return to the same old growth trajectory, once the present painful adjustment is over. That is because the crisis has revealed structural weaknesses by which future growth potential will be constrained. Unless structural weaknesses are addressed, restoring and sustaining strong growth over the long term would be difficult. In that sense, the crisis was not just a hiccup. For the sake of argument, let us assume that there was no crisis in Asia this time. If that were the case, Asian economies would eventually experience either a gradual or abrupt slowdown of growth at some point in the future, as structural weaknesses start inhibiting growth. It is worth noting that economic growth would decelerate not because Asian growth is input-driven.

Asian economies still have the potential for growth, because stylized facts such as high saving rates, strong educational base, and outward-looking economic policies remain in place. Asian economies could continue strong growth through input mobilization as they had done earlier, as long as (a) the technology gap and education gap with more advanced economies remain and (b) structural reforms are undertaken.

IV. Structural Problems Highlighted by the Crisis

The Asian crisis has shed light on a number of structural weaknesses, which had earlier been largely masked by the glaring record of growth. Asian APEC economies would not be able to achieve sustainable, robust growth in the long term without redressing such structural weaknesses. By the same token, many other APEC economies, particularly developing member economies, confront similar structural weaknesses which the crisis has shed light on for Asian APEC economies, albeit to varied extents. Tackling structural weaknesses highlighted by the crisis opens the way for achieving renewed growth in the APEC region in the 21st century.

Weakness in the financial sector

Major weaknesses spotlighted by the crisis are those in the financial sector. In particular, two areas are important, although the details differ across economies.

1) Ineffectual prudential regulations and supervision

East Asian economies have actively introduced financial deregulation and capital account liberalization over the past two decades. However, such financial deregulation and liberalization has not been accompanied by commensurate strengthening of bank regulations for prudence. Ineffectual prudential regulations and supervision had led to excessive bank exposure to foreign-currency liabilities (particularly short-term debts), and imprudent lending to such sectors as real estate and related-party lending. The implicit guarantee of the banking sector provided by governments, combined with ineffectual prudential regulations and supervision, proved very costly for the public sector. Deposit insurance schemes, which could have calmed jittery depositors, were also not in place.[1]

2) Over-reliance on bank finance

In East Asia, banks (and bank-like financial intermediaries) have been dominant in corporate finance, while capital markets, in particular, bonds markets, have been underdeveloped. Over-reliance on bank lending, together with poorly regulated banks, had resulted in vulnerable financial positions of firms (financing long-term investment with short-term borrowing and over-indebtedness). Underdeveloped capital markets contributed to insufficient market monitoring and disciplining of corporate management.

Weakness in the corporate sector

The crisis has also highlighted some weaknesses in the corporate sector.

1) Weak corporate governance

Against the backdrop of continued strong growth, firms often made bullish investment to gain larger market shares and to diversify beyond core business, without paying due consideration to profitability. As a result, particularly Korean *Chaebols* had very high debt-equity ratios. While questionable investment lowers economic growth potential over time, over-leverage had made the corporate sector susceptible to a sharp economic downturn and interest rate surges during a crisis. In addition, the lack of transparency regarding financial

[1] A deposit insurance scheme would contribute to the stability of the banking system by warding off panicked runs on banks, but it would involve the risk of instilling moral hazard on the part of bank management. These two aspects must be weighed in considering the introduction of a new insurance scheme. While many developed economies have deposit insurance schemes, some economies like New Zealand have not instituted them.

positions of firms may have aggravated the herd behavior of foreign lenders and investors, because it was difficult to discern good companies from bad companies. Corporate governance needs to be strengthened to ensure the profitability and transparency of business activities through guidance and monitoring by independent boards and financiers (banks and institutional investors).

2) Underdeveloped legal infrastructure for business

The lack of well-developed bankruptcy laws and foreclosure procedures has been hindering corporate restructuring in the wake of the crisis. Bankruptcy laws are also critical to the task of bank restructuring in working out non-performing loans and promoting a market-based banking culture. Although the crisis-hit economies have introduced new legislation for bankruptcy and foreclosure, it takes time to effectively implement such legislation because of the lack of lawyers and other legal staff with expertise and experience in the field. Exit rules for failed firms and competition policy are the twin requirements for healthy development of the corporate sector.

3) Need to develop SMEs

The Asian crisis has had profound effects on SMEs. SMEs have been particularly affected by a credit crunch. On the other hand, a well-developed SME sector appears to have helped cushion the crisis' adverse impacts on the economy. A case in point is Chinese Taipei, which has managed to weather the crisis relatively well. The vast number of firms in Chinese Taipei indicates greater competition, which would lessen the risk of poor investment and management decisions. The vertically disintegrated industrial structure prevailing in Chinese Taipei also appears to have enabled its economy to deal with the credit crunch caused by the crisis, because capital requirements for firms under such an industrial structure are generally small. Chinese Taipei's experience indicates the need for other Asian economies to create conditions conducive to the development of SMEs. A well-developed, competitive SME sector is not only the engine of growth, but also contributes to the resiliency of an economy to downside risks. Enhancing management performance through education, improving capital markets and access to them are important issues to promote SME growth.

Further need for better economic policy making

Generally speaking, the track records of economic policies in East Asia are good. East Asian economies have managed to contain inflation with prudent monetary and fiscal policies, avoid chronic over-valuation of exchange rates, and pursue outward-looking policies for trade and investment. However, there are some areas in economic policy making that need strengthening.

1) Sequencing of liberalization[2]

What has become clear is that short-term capital liberalization under an under-regulated financial sector increases vulnerability to a financial crisis. The crisis highlighted the importance of sequencing of capital account liberalization and strengthening of the financial sector. Another issue of sequencing has to do with market opening for exporting sectors and domestic-market-oriented (or import-substitution) sectors. East Asian economies have pursued active market opening and deregulation for exporting sectors such as electronics,

[2] Conventional arguments as to sequencing of liberalization measures focus on the right sequencing of liberalizing trade, long-term capital including FDI, and short-term capital. The Asian crisis has highlighted heretofore less discussed issues of sequencing.

while domestic industries such as petrochemicals and steel have remained largely sheltered from foreign investment and competition, and as a result, East Asian economies have similar export structures concentrating in electronics.[3] The narrow and similar export specialization in East Asia worked as a factor to amplify downward pressures during the crisis.

2) Exchange rate policy

De facto US-dollar-peg exchange rate regimes in Thailand and some other East Asian economies are likely to have increased vulnerability to a financial crisis, as effective exchange rates swung as the exchange rates between US dollar and other currencies fluctuated, subjecting the economies to instability through changing incentives for exports and imports. Unhedged foreign borrowings were prevalent in Thailand where its currency, baht, had been largely fixed to the dollar over more than a decade, and they brought on devastating impacts on firms and banks as the baht plummeted. The crisis highlighted the need to review the exchange rate policy. Options to be considered include to introduce more flexibility in the exchange rate, and to peg the currency to a basket of major currencies reflecting trade partners.

Underdeveloped social safety provision

In some crisis-hit economies, the number of people in poverty has most likely risen significantly on the heels of the crisis, reversing the spectacular welfare gains over the past few decades. In particular, women, children and the elderly have suffered the most.

1) Need for public assistance to secure minimal living standards

As with many developing economies in the world, East Asian economies have basically relied on informal family-based assistance for household security. The continuation of strong growth over the past few decades had lifted living standards sharply and alleviated poverty in East Asia. However, the crisis has starkly revealed the need for the government-sanctioned schemes to assist the poor in times of sharp economic downturns. From a longer-term perspective, it is particularly important to prevent poor families' children dropping out from elementary and secondary education.

2) Need for unemployment insurance

The lack of unemployment insurance was also highlighted by the crisis, as a large number of workers lost jobs. The need for income support for the unemployed through a government-sanctioned insurance scheme had been masked by the continued rapid growth which had provided plenty of new employment opportunities. In fact, with the exception of Korea, East Asian economies do not have unemployment insurance schemes. Introducing a new insurance scheme during a crisis would not be a good idea, because a new scheme would require a minimum period of prior contributions, and its funding requirements would further depress the economies. It is important to plan for the future, however, once more stable conditions return.

[3] The share of electronics in total exports had risen to 30-50% by the mid-1990s for Malaysia, the Philippines, Korea, and Thailand.

V. Growth Prospects of APEC Economies

This research project undertakes projections over the next decade and beyond, in order to assess growth potential of APEC economies and changing patterns of trade and investment in quantitative terms. As discussed above, the Asian crisis has highlighted some important structural weaknesses in the crisis-hit economies in Asia. Other APEC economies in Asia and beyond, especially developing member economies, face similar structural problems, albeit to varied extents. Long-term growth potential of the region hinges on how APEC economies address such structural problems. Thus, it is important for our projections of economic growth to take into account the significance of pursuing structural reforms on growth prospects. Our projections also need to take into account other important factors affecting future growth such as demographic changes and educational advancement. In this section, preliminary projection results of the region's growth are reported.

In our projection work, two econometric approaches are taken; conditional convergence model approach and the meta-production function approach. While both of the two approaches are firmly based on the modern theory of economic growth, they differ in the way the theory is applied empirically. Thus, the two approaches are complementary to each other. The conditional convergence model approach is based on the idea that economic growth rates among economies in different developmental stages tend to converge. The meta-production function approach attempts to estimate a production function underlying economic growth directly, and explicitly measure production efficiency with which different economies utilize their inputs of capital and labor.

Preliminary results of the two approaches are suggestive. The projection under the conditional convergence approach shows that long-term growth rate of APEC developing member economies would fall somewhat from that experienced prior to the Asian Crisis. (See Table (1).) The main reason for the fall in economic growth is in the slowdown in the speed of convergence, which is a consequence of the rise in the GDP level. Slower growth in population also contributes to the decline in economic growth. The positive effect of higher human capital stock on growth is insufficient to offset the above negative effects.

The meta-production function approach provides projection under two alternative scenarios: reform and non-reform scenarios. The reform scenario assumes full implementation of reform measures which address structural weaknesses revealed by the Asian crisis, and the non-reform scenario assumes that implementation of reform measures is incomplete. Under the reform scenario, economic growth remains high and, in the case of ASEAN, even exceeds rapid growth achieved in 1990-1997. (See Table (2).) Under the non-reform scenario, economic growth in the next decade would drop significantly from that in the 1990s. The decline in population growth would further reinforce the slowdown in economic growth.

Table: Growth Projection of the APEC Region: Preliminary Results

(1) Conditional Convergence Model Approach

	APEC Total	APEC Developed Economies	APEC Developing Economies	NIEs	ASEAN
Projection (1995-2015)	2.8	2.4	4.5	3.4	5.5
Actual (1970-1995)	3.3	2.9	7.1	8.4	6.6

(2) Meta-Production Function Approach

	APEC Total	APEC Developed Economies	APEC Developing Economies	NIEs	ASEAN
Projection (2000-2010)					
Reform Scenario	2.7	2.1	5.0	5.3	5.8
Non-Reform Scenario	2.5	2.1	4.1	4.6	3.2
Actual (1990-1997)	2.7	2.1	5.5	6.7	5.5

(Note) Annual real GDP growth rates, in percent.

The two approaches highlight the rich growth potential that APEC economies could continue to enjoy in the long-term. The conditional convergence model approach provides a reference projection in which the economies continue to follow the conditional convergence path observed prior to the Asian crisis. The meta-production function approach, on the other hand, shows the importance of the implementation of reform measures. It shows that addressing underlying structural weaknesses of APEC economies in Asia and beyond is vital for maximizing their long-term growth potential and realizing sustainable growth in the APEC region.

Box 2: Econometric Approaches to Growth Projection

The conditional convergence model approach is based on the idea that economic growth rates among economies in different developmental stages tend to converge. That is, the lower the initial level of per capita GDP of an economy is, the higher its economic growth rate for later years is, and as the economy gets matured, its pace of growth converges to that of more developed economies. However, it is also acknowledged that such convergence is conditional, in the sense that it can be observed only when differences in such factors as human capital stock and physical capital investment are taken into account.

The meta-production function approach attempts to estimate a production function underlying economic growth directly, unlike the conditional convergence approach. The meta-production assumes that; (i) all economies under consideration are subject to the same underlying production function, and (ii) each economy differs in the efficiency with which they utilize their inputs of capital and labor. The advantage of this approach is that the level of efficiency and the speed of efficiency improvement can be compared among different economies. An economy with the highest efficiency can be identified as the best practice economy (or most advanced economy), and other economies can be considered to be in the process of catching up to the best practice economy. These features come in handy when simulations under different scenarios are undertaken.

The meta-production function approach provides projection under two alternative scenarios; reform and non-reform scenarios. The reform scenario assumes full implementation of reform measures which address structural weaknesses revealed by the Asian crisis. The speed of efficiency improvement and the ratio of investment to GDP are assumed to be high under this scenario. In contrast, the non-reform scenario assumes that implementation of reform measures is unsatisfactory. The speed of efficiency improvement and the investment/GDP ratio are assumed to be lower under the non-reform scenario.

VI Refocusing APEC's Strategy for Cooperation

Longer-term focus of APEC's response to the crisis

What can APEC do to help its member economies put the crisis behind them and realize sustained growth in the next millennium? It is proposed that the primary focus of APEC's response to the crisis be on longer-term issues, rather than on acute, short-term issues of crisis resolution.

International financial institutions such as IMF, World Bank, and ADB, and industrialized countries have been providing assistance in the form of financial resources and technical advise to crisis-affected economies to get over the crisis. APEC does not have a strong comparative advantage over international financial institutions in the areas of addressing short-term issues of crisis resolution, or fighting a raging fire.

However, there is much scope for APEC in helping its member economies redress structural weaknesses highlighted by the crisis so as to maximize growth potential and attain robust growth in the APEC region in the long run. The above preliminary study on growth

projections underscores in quantitative terms the importance of structural reforms for realizing renewed growth over the longer-term.

APEC has a unique potential to assist member economies to strengthen the basis for growth, because of diversity among members. Vastly different developmental stages of member economies make sharing experiences in policy design and implementation most effective.

Consolidating the basis for growth in the 21st century

In order to regain and sustain vigorous growth in the next millennium, it is very important to address structural weaknesses highlighted by the crisis during the recovery phase from the devastation inflicted by the crisis. Structural weaknesses of the crisis-hit APEC economies in Asia are shared, albeit to varied extents, by many other APEC economies, particularly developing member economies.

As discussed earlier, structural weaknesses highlighted by the crisis include weaknesses in the financial sector, the corporate sector, and economic and social policy frameworks. Tackling such weaknesses is essential for APEC economies to consolidate the basis for growth in the 21st century.

A suggested broad policy direction is that APEC consider refocusing APEC cooperation under the goal of "consolidating the basis for growth in the 21st century" for the next few years. "Consolidating the basis for growth" requires strengthening and opening markets and developing social framework, in order to redress structural problems which would inhibit growth in the long run. This goal of consolidating the basis for growth, which is of cross-cutting nature, would not replace TILF and ECOTECH as pillar policy agendas. Instead, it would facilitate prioritizing various ECOTECH activities to those directly bearing on strengthening and opening markets and developing social framework. It would also enable TILF and ECOTECH to be promoted in an integrated manner. Cooperation in the following areas is particularly important for consolidating the basis for growth. Specific arrangements to promote focused cooperation under the goal of consolidating the basis for growth need to be explored.

Priority areas for cooperation for consolidating the basis for growth

<u>1) Institution building and human resources development for structural reforms</u>
Institution building and human resources development are the key for redressing structural weaknesses highlighted by the crisis. The goal of consolidating the basis for growth enables a more focused approach to ECOTECH cooperation by addressing cross-cutting structural problems in the following areas.

- financial sector development (capital market development, supervision and prudential regulations etc.)
- competition policy and deregulation
- strengthening the corporate sector (corporate governance, legal infrastructure for business such as bankruptcy law, and development of SMEs and new business)
- economic policy governance (strengthening the capacity for policy planning and economic analysis)
- social safety nets

APEC has already undertaken important initiatives in this regard, and future APEC cooperation should build on such stocktaking within APEC, while avoiding duplication

between various fora. In particular, as regards the financial sector development, APEC Finance Ministers have undertaken initiatives to strengthen regional financial and capital markets. The following initiatives are also important.

- Australian initiative on economic governance capacity building
- New Zealand's initiative on competition and regulatory principles
- US initiative on the social framework for growth
- April 1999 Joint Ministerial Statement by SME Ministers
- Japan's new initiatives on human resources development for structural reforms and strengthening market infrastructure
- Korea's initiative on knowledge-based industries

2) Trade and investment liberalization and facilitation

Trade and investment liberalization and facilitation (TILF) promotes growth in the region through more efficient international division of work and transfer of technology. It should be also noted that TILF is conducive to strengthening markets and thus consolidating the basis for growth, because promoting TILF addresses some of structural weaknesses highlighted by the crisis through increased competition and higher standards for corporate governance introduced by foreign investors. The 1999 study on the impact of trade liberalization carried out by the Economic Committee indicates that the implementation of trade liberalization and facilitation committed to date by APEC economies would increase real income (GDP) in the region by 0.4% or US$75 billion (at 1997 prices) per year.

There is scope for a more integrated approach to TILF and ECOTECH in two areas. First, facilitation of trade and investment has a great potential for expanding regional trade and investment and thus for reinvigorating growth, ECOTECH cooperation for facilitation should be given a priority. Second, as more liberalized trade and investment could produce adversely-affected groups in the society, ECOTECH cooperation focused on flexible labor markets and skills development is particularly important for consolidating the basis for growth through TILF.