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Labour Shortage Responses in Japan, Korea, Singapore, Hong Kong, and Malaysia: A Review and Evaluation

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Abstract
[Excerpt] Japan and the East Asian tiger economies of Korea, Singapore, Hong Kong, (as well as Taiwan) and more recently Malaysia are often touted as the preeminent examples of economies that attained, or have come close to attaining, at different periods of time, the desirable path of high growth, low unemployment, low inflation, that is spread enough to radically reduce absolute poverty in those respective countries.

Japan achieved what has been called its post-war economic miracle from 1952 to 1973, allowing it to wipe out poverty in the country. And while its growth has been relatively stagnant for more than a decade now, it is still the world's second largest economy possessing one of its highest per capita incomes. Korea's ascension to the ranks of industrialized economies was more recent but quite rapid, occurring from the early 1980s to the present, its run broken only briefly by the Asian financial crisis of the late 1990s. Estimates of the poverty incidence in Korea differ but typically place it at the low single digits. Singapore began its own climb towards developed-country status immediately after its independence in 1965 and after opening up to foreign investors - over the last four decades it has grown at an average annual rate of better than 8 percent. Hong Kong's growth began even earlier in the 1950s and 1960s as exporter of textiles, clothes, and toys, although it has moved mainly to financial and trade services since the 1980s – it has grown more than 7 percent per year in the last four decades. Malaysia's development is the most recent of the five countries, having in fact benefited from foreign direct investments from the earlier developers in the group, particularly Japan and Singapore.

The paths taken by the five economies towards industrialization are quite similar, with growth propelled, at least initially, by very robust industrial sectors stimulated by foreign direct investments directed towards exports. There are still disagreements on the ultimate causes of these developments, with some arguing for the large investments in human and physical capital undertaken in these economies, others from the demographic dividend from the baby boom generation, etc.

What is not in disagreement, and what has been much discussed recently, is that as a consequence of their development paths, all five economies have faced and will continue to face in the coming decades the problem of labour shortage.

There are strong demand and supply forces causing the labour shortage in the five economies. On the demand side, rapid and sustained economic growth required and will likely continue to require a steady increase in the labour force2. Further on the demand side, as a consequence of moving towards more knowledge-based economies, the need for highly-skilled and highly-educated workforce in specific sectors has outstripped what each country can domestically supply. On the supply side, as the economies of the five economies grew, their total fertility rates fell to what is now very much below the replacement level of about two. Furthermore, as per capita income and the standard of living increased in these economies, reservation wages of the domestic workforce have also increased, especially for low-skilled jobs deemed "difficult, dangerous and dirty" or 3-D jobs, thus adding to the supply pressure. The shortage in labour is thus present in the *aggregate* and for *specific*jobs or sectors.

All five economies have already implemented various responses to the labour shortages they have faced and are anticipating. Drawing from the available literature, this paper will discuss the extent of the labour shortage in these five economies and their past and present responses to it with a view towards evaluating which policies have worked and are likely to work in the future. The paper proceeds as follows: Section 2 discusses

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the extent of the labour shortage in Japan, Korea, Singapore, Hong Kong, and Malaysia. Section 3 outlines a model that is used to frame the labour-shortage issue. Section 4 reviews the responses to labour-shortage in the five economies. Section 5 concludes.

Keywords
labour shortage, economic implication, Japan, Korea R, Singapore, Hong Kong, China, Malaysia

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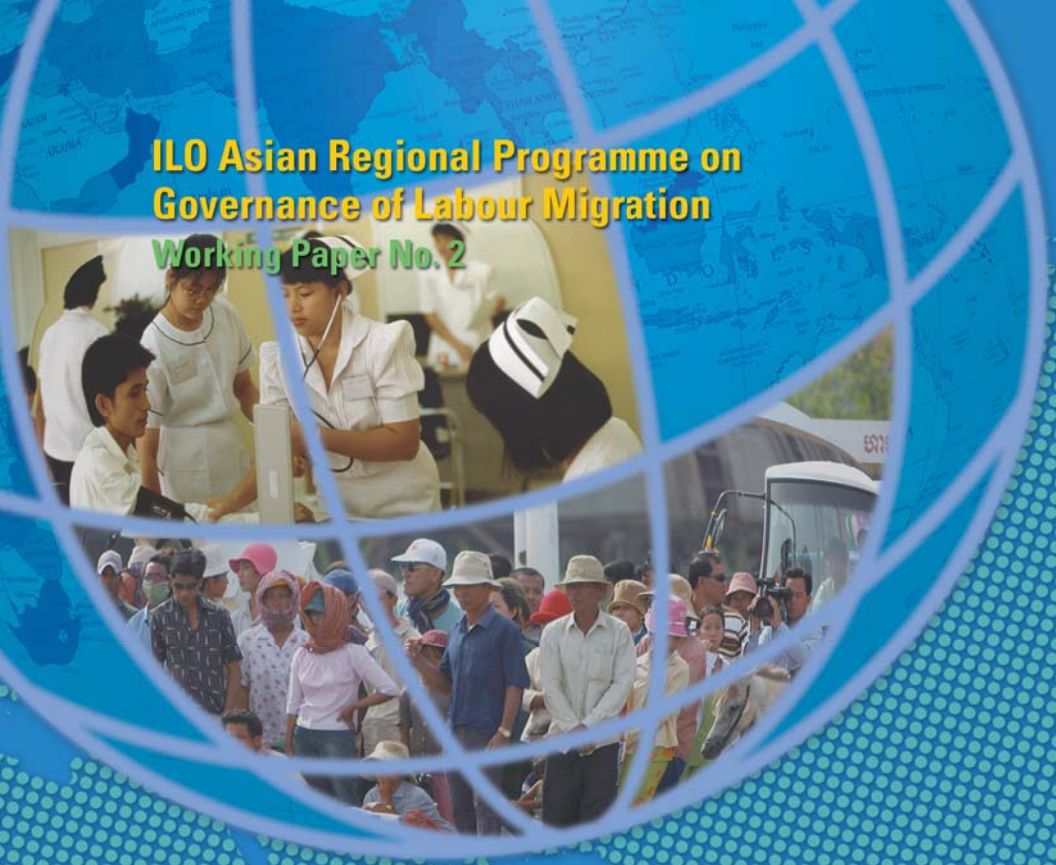

International Labour Organization

European Union

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Geoffrey Ducanes and Manolo Abella

Regional Office for Asia and the Pacific
January 2008

ILO Asian Regional Programme on Governance of Labour Migration
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Geoffrey Ducanes and Manolo Abella

January 2008

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Labour Shortage Responses in Japan, Korea, Singapore, Hong Kong, and Malaysia: A Review and Evaluation

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Labour Shortage Responses in Japan, Korea, Singapore, Hong Kong, and Malaysia: A Review and Evaluation

Geoffrey Ducanes and Manolo Abella*

1. Introduction

Japan and the East Asian tiger economies[1] of Korea, Singapore, Hong Kong, (as well as Taiwan) and more recently Malaysia are often touted as the preeminent examples of economies that attained, or have come close to attaining, at different periods of time, the desirable path of high growth, low unemployment, low inflation, that is spread enough to radically reduce absolute poverty in those respective countries (World Bank 1997). Appendix Figure 1 shows the time paths of the main macroeconomic variables for the five countries over the last 3-4 decades.

Japan achieved what has been called its post-war economic miracle from 1952 to 1973, allowing it to wipe out poverty in the country. And while its growth has been relatively stagnant for more than a decade now, it is still the world's second largest economy possessing one of its highest per capita incomes. Korea's ascension to the ranks of industrialized economies was more recent but quite rapid, occurring from the early 1980s to the present, its run broken only briefly by the Asian financial crisis of the late 1990s. Estimates of the poverty incidence in Korea differ but typically place it at the low single digits. Singapore began its own climb towards developed-country status immediately after its independence in 1965 and after opening up to foreign investors - over the last four decades it has grown at an average annual rate of better than 8 percent. Hong Kong's growth began even earlier in the 1950s and 1960s as exporter of textiles, clothes, and toys, although it has moved mainly to financial and trade services since the 1980s – it has grown more than 7 percent per year in the last four decades. Malaysia's development is the most recent of the five countries, having in fact benefited from foreign direct investments from the earlier developers in the group, particularly Japan and Singapore.

The paths taken by the five economies towards industrialization are quite similar, with growth propelled, at least initially, by very robust industrial sectors stimulated by foreign direct investments directed towards exports. There are still disagreements on the ultimate causes of these developments, with some arguing for the large investments in human and physical capital undertaken in these economies (World Bank 1997), others from the demographic dividend from the baby boom generation (Phang 2005), etc.

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* Technical Officer and Chief Technical Adviser, respectively, ILO Asian Regional Programme on Governance of Migration.

[1] The term economy is used instead of country because Hong Kong, while operating virtually as an independent economy, is under the sovereignty of the People's Republic of China. Hong Kong's full name is the Hong Kong Special Administrative Region of the People's Republic of China. The UN also considers Taiwan as merely a province of China.

What is not in disagreement, and what has been much discussed recently, is that as a consequence of their development paths, all five economies have faced and will continue to face in the coming decades the problem of labour shortage.

There are strong demand and supply forces causing the labour shortage in the five economies. On the demand side, rapid and sustained economic growth required and will likely continue to require a steady increase in the labour force[2]. Further on the demand side, as a consequence of moving towards more knowledge-based economies, the need for highly-skilled and highly-educated workforce in specific sectors has outstripped what each country can domestically supply. On the supply side, as the economies of the five economies grew, their total fertility rates fell to what is now very much below the replacement level of about two (Figures 2.1a, 2.2a, 2.3a, 2.4a, and 2.5a). Furthermore, as per capita income and the standard of living increased in these economies, reservation wages of the domestic workforce have also increased, especially for low-skilled jobs deemed "difficult, dangerous and dirty" or 3-D jobs, thus adding to the supply pressure.[3] The shortage in labour is thus present in the *aggregate* and for *specific* jobs or sectors.

All five economies have already implemented various responses to the labour shortages they have faced and are anticipating. Drawing from the available literature, this paper will discuss the extent of the labour shortage in these five economies and their past and present responses to it with a view towards evaluating which policies have worked and are likely to work in the future. The paper proceeds as follows: Section 2 discusses the extent of the labour shortage in Japan, Korea, Singapore, Hong Kong, and Malaysia. Section 3 outlines a model that is used to frame the labour-shortage issue. Section 4 reviews the responses to labour-shortage in the five economies. Section 5 concludes.

2. Extent of Labour Shortage

2.1. Japan

With the world's longest life expectancy as of 2005 of 81.5 years and a very low total fertility rate of 1.3 (Figure 2.1a), the population of Japan is ageing rapidly and has, in fact, already started to decline.[4] Average annual number of births from 2000 to 2005 is 1.18 million, which means that less than one baby is born per year for every 100 people in Japan.[5] The decline in the working age population (15-64) has occurred even earlier, declining from 87.2 million in 1995 to 86.6 million in 2000. These trends in ageing, population and workforce are expected to continue. By 2050, the working age population is projected to be at 57 million only. Figure 2.1b shows the ratio of the 65-and-over population to the 15-64 population in Japan, and for comparison also shows the ratio for Asia as a whole. By 2050,

---

[2] Increases in physical capital and improvement in technology or productivity are also drivers of growth. In most cases, a steady improvement in all 3 factors is needed.

[3] Sometimes, described alternatively as "difficult, dangerous, and dull." According to Bohning (1996), a better term is SALEP (Shunned by ALl Except the very Poorest).

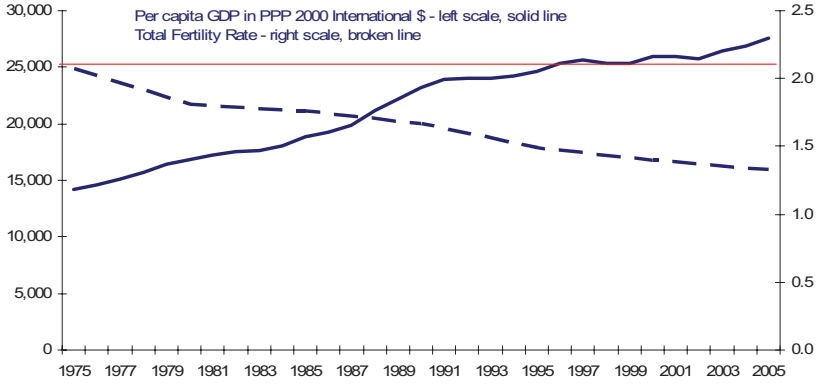
[4] From 127.0 million in 2000 to 126.1 million in 2005 according to USA Today (2006) citing the National Institute of Population and Social Security Research in Japan.

[5] According to Jiro (1991) two factors are behind the declining birth rate: first that the pool of women in the prime childbearing years of 25-29 has been declining; and second that more adults are choosing to marry later or are remaining single. Japan is said to effectively have the highest national average age for first marriage.

for every 10 people of working age in Japan, there will be 7 people of retirement age, from one in 1950 and 3 at present. The comparable figure for the Asia as a whole is only 2.5 people of retirement age per 10 people of working age.[6] In the future, if left unaddressed, this implies heavy fiscal pressure for the government and a large tax burden on the workforce, especially as Japan's Social Security System is largely on a pay-as-you-go basis.

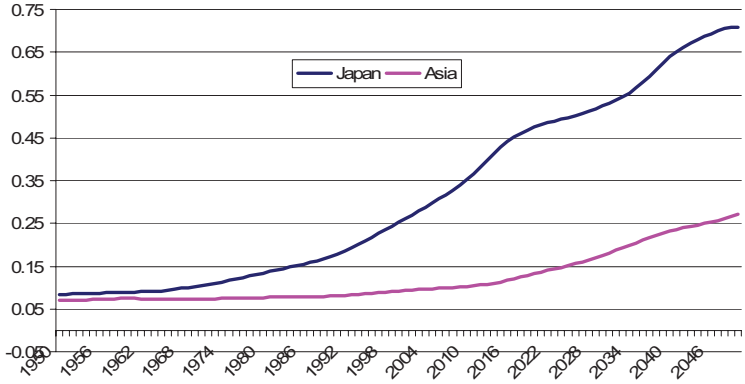
The cause of labour shortage is not merely demographic, however. The advance of enterprises into new business areas, the growing share of the service sector, and the expanded period of stable growth that has raised per capita incomes and made workers, especially the younger ones more picky, has contributed to the labour shortage (JLBc, 1992). Japanese workers reject 3-D jobs and even better jobs in small and medium-sized firms, preferring instead to work for big companies that offer higher wages, more benefits, and better prospects (do Rosario, 1990; JLBa, 1992). There is also a shortage in skilled labor, as in the recently reported need for 170,000 software engineers.[7]

Figure 2.1a. Total fertility rate and per capita GDP in Japan



[6] The figure for Asia will of course be even lower if one removes Japan from the computation.
[7] USA Today (2006).

Figure 2.1b. Ratio of 65-and-over population to 15-64 population, Japan



Source: United Nations Population Division, 2004

2.2. Korea

Because the decline in fertility rate was more recent in Korea than in Japan (Figure 2.2a), the demographic pressure on labour is not as severe but is present nevertheless (McDonald and Kippen, 2000). Overall population in Korea is not projected to decline until 2025 but working age population is seen to start falling beginning 2016. From the current level of 34.8 million, the working age population is projected in the country to be at only 23.9 million by 2050. The old-age dependency ratio is expected to increase even faster in Korea than in Japan and by 2050 is projected at 0.65 (Figure 2.2b).

But more immediately, the major cause of labor shortage in Korea is the lack of native workers willing to take on 3-D jobs mostly in small manufacturing business and construction (Bohning 1994). The Ministry of Labour as of 2006 estimates that manufacturing businesses are short of about 120,000 to 150,000 workers while about 50,000 workers are needed in construction due also partly to the ageing of existing Korean workers.

Figure 2.2a. Total fertility rate and per capita GDP in Korea

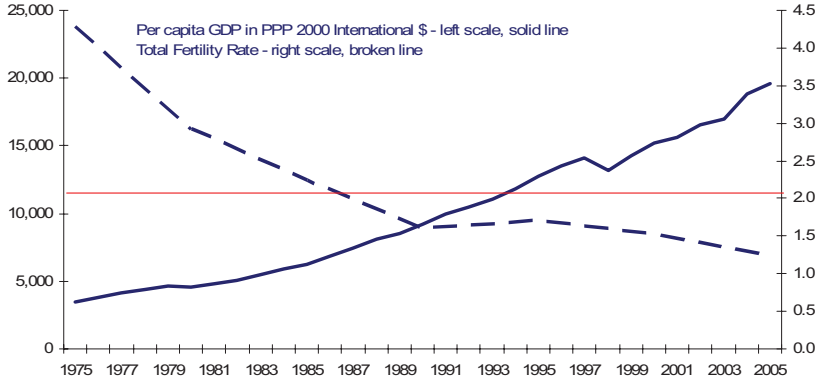
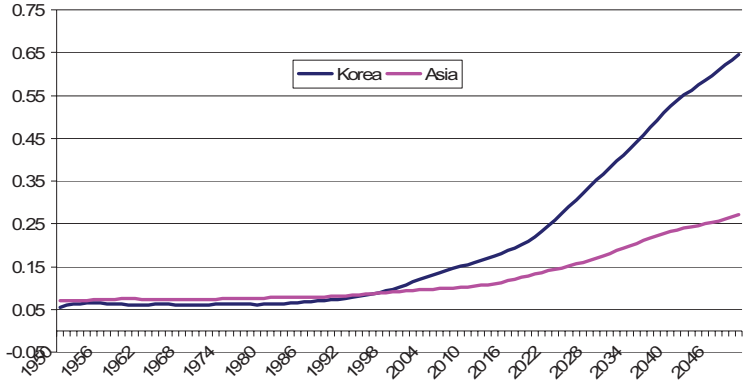


Figure 2.2b. Ratio of 65-and-over population to 15-64 population, Korea



Source: United Nations Population Division, 2004

2.3. Singapore

Singapore, much more than any of the other four economies considered, has had a much longer history of labour shortage and dependence on foreign labour, having been, in the words of Yeoh (2007), "the child of imperial and labor diasporas in the days of the Empire". At present, foreign workers comprise more than a fourth of its labour force. Labour shortage experienced over the last several decades has been for both high-skilled work (WSJ 1984) and low- and semi-skilled work, such as in the lower level service sectors and among production workers in small and medium enterprises (Gross 1999).

Demographic pressure in future years will likewise be severe. As the economy grew and opportunities opened up for women and also partially as a result of its birth-control program in the 1960s and 1970s captured in the slogan "Stop at two" (Hui and Hashmi 2004), fertility rate has been below replacement level since the late 1970s, and was an at all time low of 1.4 in 2005 (Figure 2.3a). The old age dependency ratio is expected to increase from 12 percent to 56 percent from 2007 to 2050 (Figure 2.3b), with the working age population declining from 3.2 million to 2.9 million even as the population of those 65 and older is expected to rise from 399 thousand to 1.6 million in the same period. Kalirajan and Shantakunar (1998) notes that this will pose a tremendous economic burden for Singapore in the future, although a major mitigating factor is its fully-funded social security system.

The labour shortage problem in the country is compounded by the departure of Singapore's own workers, often skilled workers trained in Singapore's own institutes, who are dissatisfied with the strict regulations in the country (The Oregon 1990).[8] Every year about 800 Singaporeans give up their citizenships (Yeoh 2007).

[8] According to The Oregon (1990), examples of such regulations are yellow traffic lights that last only a split second, taxis equipped with chimes when the speed limit is exceeded, restrictions on some foreign publications, prohibitive tax on automobiles, dictated career choice, and even strict penalties for failing to flush in public restrooms.

Figure 2.3a. Total fertility rate and per capita GDP in Singapore

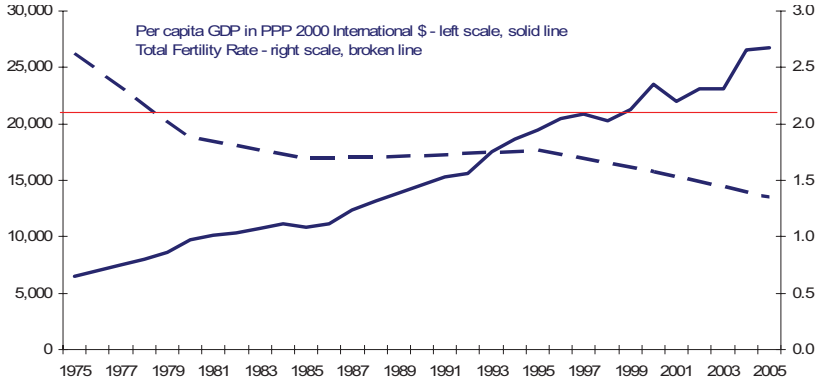
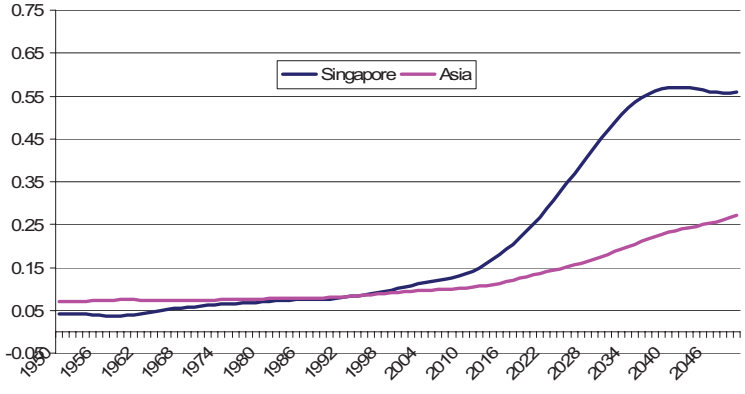


Figure 2.3b. Ratio of 65-and-over population to 15-64 population, Singapore



Source: United Nations Population Division, 2004

2.4. Hong Kong

Hong Kong's labour shortage problem originates mainly from the very high demand for high-skilled labour in the country, as the territory took on the role of being Greater China's financial and supply chain hub since the latter opened up to foreign investments in the late 1970s (Birmingham Post 2006). As China's economy continues to surge, the demand for skilled labour in the country has only intensified and maybe the binding constraint in the economy (South China Morning Post 2000). The labour shortage is particularly severe in high tech industries - a survey made by the local Internet Professionals Association in 2001 found 98 percent of 88 companies surveyed as having some staff shortage problems, with more than 10 percent looking for chief executives, and 90 percent citing labour shortage as the biggest challenge facing the industry (South China Morning Post 2001). The government's own study projects a shortage of 100,000 well-educated workers by 2007 (Birmingham Post 2006). To make matters worse, in recent years, enrolment in business and engineering programs are reported to be declining and that there has been a net outflow of foreign resident in the country. Cangbai (2007) reports that based on census data the number of Hong Kong residents who have transferred to the mainland has almost doubled

to 237,500 in 2005 from 122,300 in 1995, of which 42 percent have had tertiary education and mostly working as managers, administrators, and professionals.

Long-term prospects for labour self-sufficiency are also dim for Hong Kong. The territory has the lowest total fertility rate in the world (Yip et al. 2001), which was at 0.94 in 2005 from 2.32 at the beginning of the 1980s (Figure 2.4a). The old-age dependency ratio is expected to increase from 0.16 in 2007 to 0.58 by 2050 (Figure 2.4b). As in Singapore, rising income, education, and employment opportunities for women played a crucial role in the declining fertility levels, as these led to "delays in childbirths, increasing preference from small and childless family by couples" as well as increasing preference for remaining single – over 20% of the female population of the territory is expected to remain permanently single and childless (CSD-CSDQL 2006).

Figure 2.4a. Total fertility rate and per capita GDP in Hong Kong

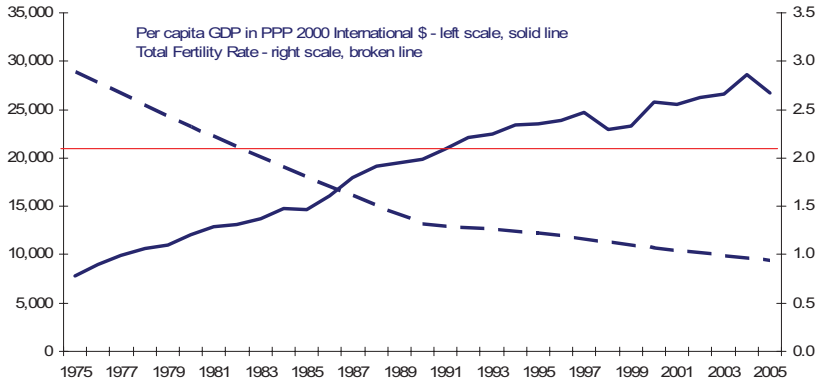
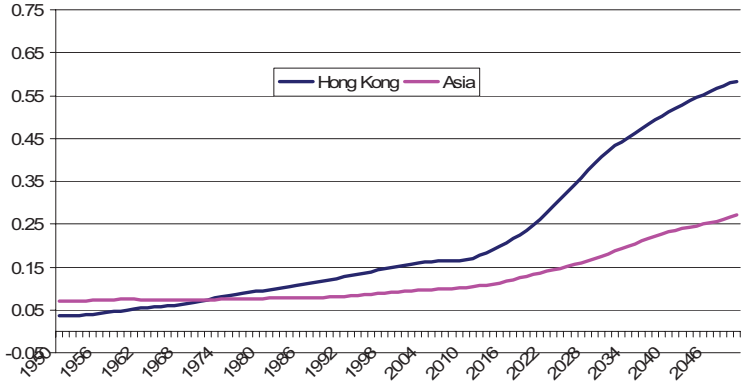


Figure 2.4b. Ratio of 65-and-over population to 15-64 population, Hong Kong



Source: United Nations Population Division, 2004

2.5. Malaysia

Malaysia's rapid economic growth beginning in the 1980s on the back of very strong foreign direct investments from Japan and the East Asian tigers moving away from basic

manufacturing is the main cause of acute manpower shortage in the country (Ruppert 1999; New Straits Times 1996). The shortage is mainly in low-skilled jobs although shortage is also experienced in some high-skilled jobs, especially as many skilled Malaysians go to other economies such as Singapore and Taiwan for more lucrative jobs (New Straits Times 1996). In addition, it is believed there is a mismatch between what the formal schooling system offers and the evolving human resource needs of the country, and that tertiary and vocational enrollment lags very far behind Japan, Korea, and Singapore (Narayanan and Wah 2000). Malaysia is different from the four other economies considered in this survey in that its economy is still dominated by the industrial sector, whereas all the four other economies have become dominated by the services sector.[9] Demographic pressures are quite weak in Malaysia as total fertility is above the replacement level (Figure 2.5a) and the old-age dependency ratio is even below the average for the whole Asia (Figure 2.5b).

Figure 2.5a. Total fertility rate and per capita GDP in Malaysia

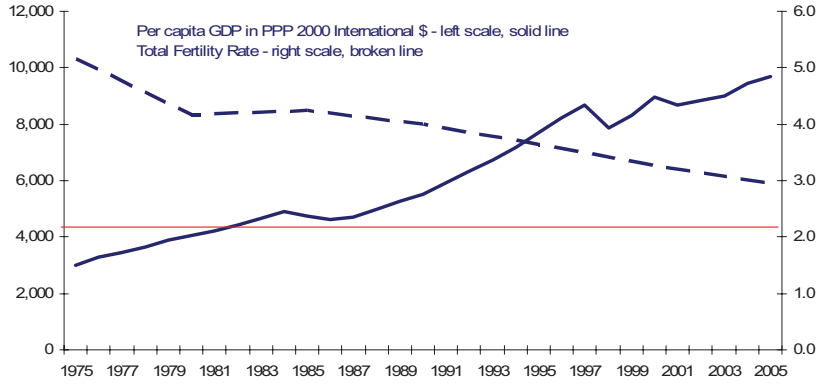
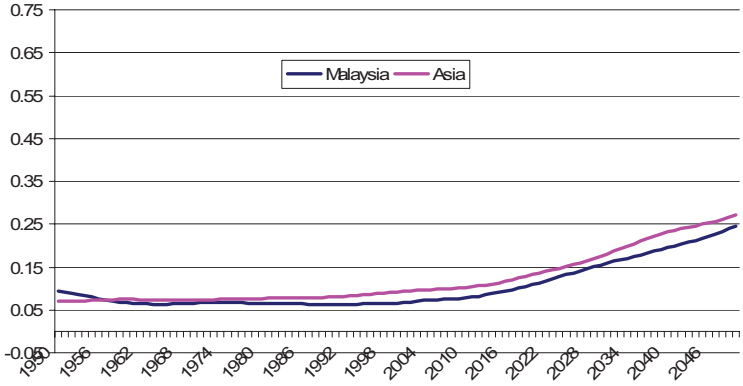


Figure 2.5b. Ratio of 65-and-over population to 15-64 population, Malaysia



Source: United Nations Population Division, 2004

[9] In 2004, 50% of Malaysia's GDP came from the industrial sector and 40% from the services sector. In contrast, around the same period, the share of the services sector was 90% in Hong Kong (10% industrial share), 68% in Japan (31%), 55% in Korea (41%), and 66% in Singapore (34%).

3. Labour Shortage Model

Let the output of the economy be denoted by

$$Y_t = f(A_t, K_t, E_t),$$

where ***A*** represents the level of technology, ***K*** the level of capital, ***E*** the level of employment, and the subscript ***t*** the time period.

The economic objective is to attain a particular growth rate of the economy consistent with maintaining a certain standard of living.

$$\dot{Y}t = \frac{dY_t}{dt} = \lambda$$

Assume a labour shortage, or a shortage in ***E***, beginning time ***t* + 1,** which maybe demographic in origin or may derive from a rapid growth in the overall economy or just in specific sectors or as a consequence of changing preference of domestic workers. To attain the target growth rate of output $\dot{Y}t = \lambda$, several options are available.

One alternative is to raise ***K*** (automation), which means additional spending on physical capital. Another alternative is to try and raise ***A*** (technological or productivity improvement) which requires investment in research and development. These alternatives are costly and may take time to put in effect or to take effect.

Now, total employment maybe broken down into domestic labour units and migrant labour units.

$$E_t = E_t^D + E_t^F$$

where the superscript ***D*** denotes domestic and the superscript ***F*** denotes foreign. It will also be useful to break down the domestic and migrant labour units into two types: high-skilled and low-skilled.

$$E_t^D = E_t^{DH} + E_t^{DL} \qquad\qquad E_t^F = E_t^{FH} + E_t^{FL}$$

where for the second superscript, ***H*** denotes high-skilled and ***L*** denotes low-skilled.

Furthermore, the domestic labour force can be divided into employed labour units and unemployed labour units.

$$L_t^D = E_t^D + U_t^D$$

where ***L*** denotes the labour force and ***U*** denotes the unemployed.

Possible reasons for the existence of unemployed domestic labour units despite the labour shortage are that reservation wages are high relative to the prevailing wages for the available jobs, a mismatch of skills, and lack of labour mobility. The unemployed labor units could also be divided into the two types according to skills.

$$U_t^D = U_t^{DH} + U_t^{DL}$$

The domestic working age population could also be divided into those in the labour force and those not in the labour force.

$$W_t^D = L_t^D + NL_t^D$$

where $\boldsymbol{W}$ denotes the working age population and $\boldsymbol{NL}$ denotes those not in the labour force.

Those of working age but not in the labour force are there for several possible reasons: as with the unemployed, they may have too high reservation wages for the available jobs, skills mismatch, lack of labour mobility, and also other constraints such as schooling, and household obligations such as taking care of the children or the elderly. Those not in the labour force could likewise be divided into two types according to skills.

$$NL_t^D = NL_t^{DH} + NL_t^{DL}$$

From here it is clear what other options are available to the policymaker to address the labour shortage.

First, it can make the existing employed labour units (E_t) work more hours or postpone retirement. This is equivalent to creating additional labour units. Of course this is option is constrained by the existing number of working hours and retirement age already in place, which could possibly be high already.

Second, the policymaker can entice the unemployed domestic labour units (U_t) to take on the available jobs ($U_t \rightarrow E_{t+1}$). If the problem is only reservation wages, the policymaker can enact measures so as to raise wages for these jobs. If the problem is only labour mobility, then the policymaker can transport workers to the places in need of them. If the problem is skills mismatch, say if the need is for high-skilled workers and the unemployed are mostly low-skilled (U_t^{DL}), then training, which is costly and time consuming, will be needed. All these assume that the unemployment rate is still high relative to the natural rate.

Third, the policymaker can try to get those potential workers who are not in the labour force (NL_t) to take on the available jobs ($NL_t \rightarrow E_{t+1}$). Similar to the case of the unemployed, this maybe done by raising wages for the available jobs, transporting workers, and providing training to the low-skilled (NL_t^{DL}) non-labour force participants if the need is for high-skilled workers. Additionally, if the constraint is household obligations such as taking care of children or the elderly, the policymaker can put up institutions to take care of these during

working-hours, such as child-care or elderly-care centers. Again there are costs associated with this alternative and it presupposes also that there is room to increase domestic labour-force participation.

Fourth, the policymaker can allow migrant workers to take on the available jobs ($E_{t+1}^{F} > E_{t}^{F}$). The policymaker can tailor fit its admission policy to the particular skill requirements needed so that training is avoided or minimized in the case of need for skilled workers, and the need to raise wages is avoided in the case of need for unskilled workers, as migrant workers of this type typically come from where wages for similar work are much lower.

For some economies, there is a reluctance to admit foreign workers for non-economic reasons, such as preserving the country's homogeneity or for reasons of national security. These maybe counted as costs to this alternative. In addition, allowing migrant workers entry may affect the relative wages between the high-skilled and low-skilled workers, depending on which type of migrant workers enter. This alternative may thus face some opposition from existing workers which maybe counted as an additional cost.

Fifth, outsourcing is another alternative available. It takes time to establish the links necessary for this, however. Also, this maybe unpopular as it can be seen to take away jobs from domestic workers.

Sixth, relocating those industries with labour shortage is also an alternative. This would be costly and will take time, however, in addition to possibly causing some unemployment in areas that will be left by the industries.

In sum, the alternatives available to the policymaker are automation (raise K), technological improvement (raise A), making existing workers work longer hours or postpone retirement (extend E_t), employ the unemployed (employ U_t) or those not part of the labour force (employ NL_t), hiring more migrant workers (increase E^F), outsource, and relocate.

Whichever alternative or combination of alternatives is finally undertaken will be determined by the costs of the alternatives, including social costs, and their supposed effectiveness and adequacy in addressing the labour shortage problem.

4. Labour Shortage Responses

4.1. Japan

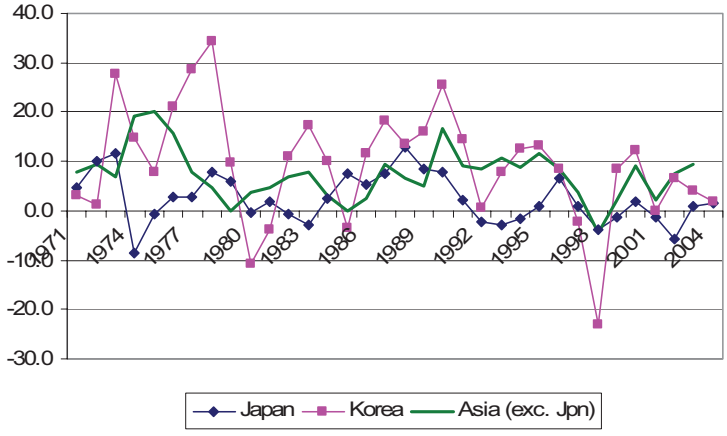
Because labour shortage in the country has long been predicted and due to its extent, the Japanese government and private enterprises have instituted plenty of responses to try and address the problem.

raising K and A

In 1991, Japan introduced the Law Securing Personnel in Smaller Firms, which offered assistance to firms for labor-saving investments such as the introduction of labor-saving

technologies and improvements in equipment (JLBb, 1992). Data is not available to conclusively evaluate the effectiveness of this policy. In the aggregate, in fact, despite this incentive, growth in gross fixed capital formation in the country has fallen substantially since the introduction of the law. From 1985 to 1990, gross fixed capital formation grew at an average rate of 8.3%, whereas in the years since, the average growth has been slightly below zero. The latter growth has typically been way below the average for the rest of Asia as maybe seen from Figure 4.1a.

Figure 4.1a. Growth in Gross Fixed Capital Formation

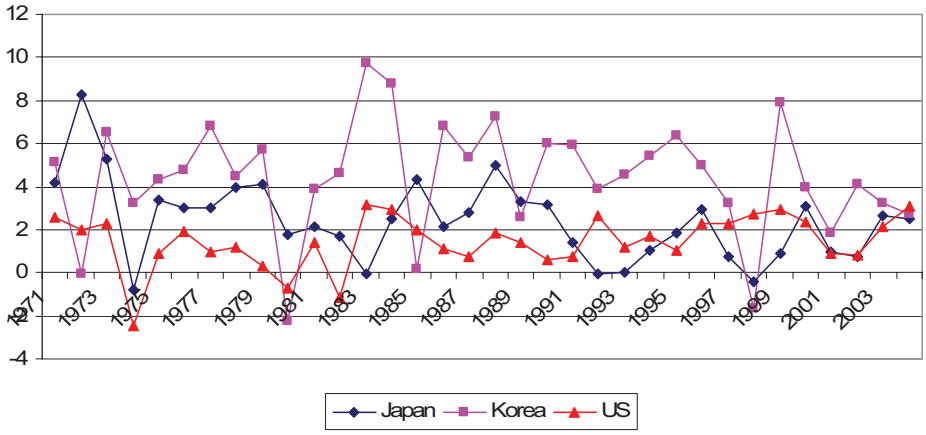


Source: World Development Indicators 2005

On the other hand, in the absence of further evidence, one cannot be fairly certain about the counterfactual. It is entirely possible investment growth or the quality of the investment could have been lower in the absence of this law. For instance, Teresko (1991) reports that the performance of factory automation firms has been strong, even through recessions. In fact, labour productivity in Japan has, except in a few instances, grown at a positive rate, averaging 1.8% since 1980, which is higher than the average for the US of 1.7% for the same period, although much lower than the figure for Korea of 4.6%. See Figure 4.1b. A large part of this maybe due to the country's heavy emphasis on research and development. Investment in research and technology as a percentage of GDP and the number of research and development workers per million people are among the highest in the world, surpassing even the US' (see Figures 4.1c and 4.1d).

Automation cannot be a complete solution, however. For instance, labour shortage is acute for small construction firms for which the alternative of substituting mechanization or even FDI is unavailable (JLBa, 1992).

Figure 4.1b. Growth in Labor Productivity



Source: World Development Indicators 2005 and ILO Labor Statistics Database

Figure 4.1c. Research and Development Expenditure as % of GDP, 2002

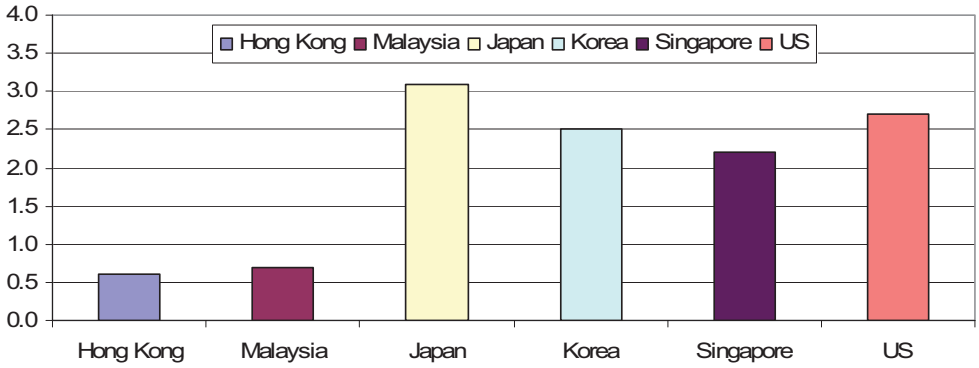
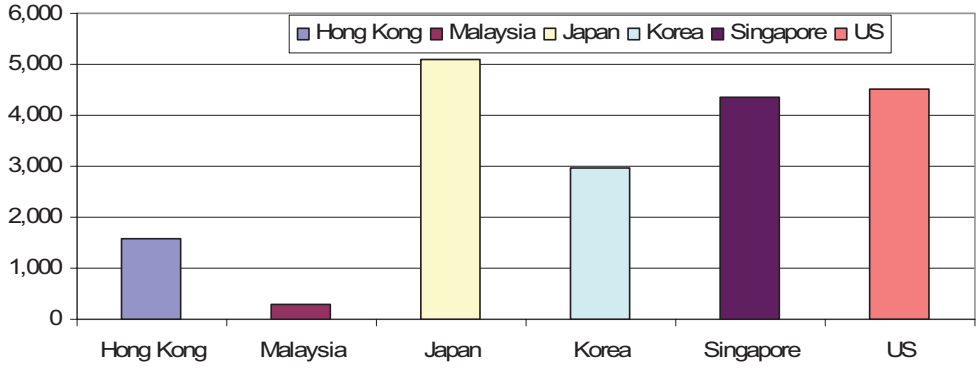


Figure 4.1d. Number of Research and Development Workers per Million People, 2002



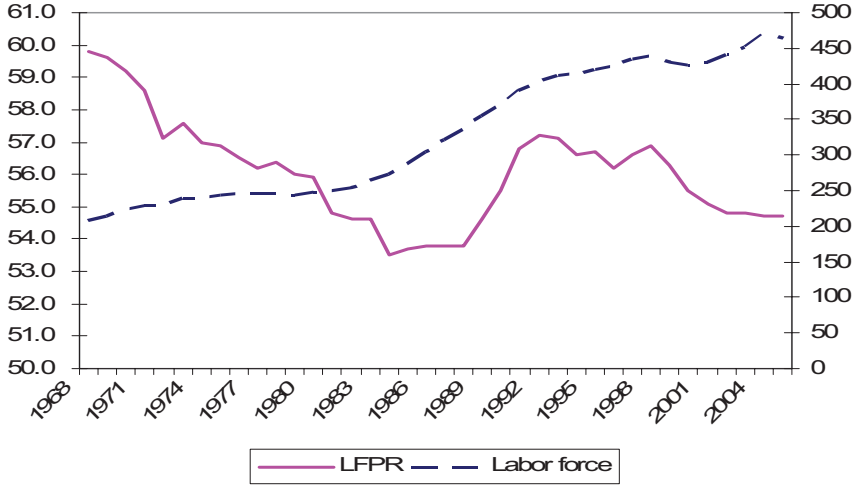
extending E_t

Another means through which enterprises have sought to alleviate labour shortage problems is through the rehiring of retired workers and the raising of the retirement age to 65 from 60.

Government enacted the Law Concerning the Stabilization of Aged Workers Employment, which provided employment security for those in their early 60s and established premiums for employment of many older people. In 2006, this law was amended so that employers who set the mandatory retirement age below 65 either extend the mandatory retirement age to 65, introduce a re-employment system for employees between ages 60 and 65, or abolish mandatory retirement (Ueno *et al.*, 2006).

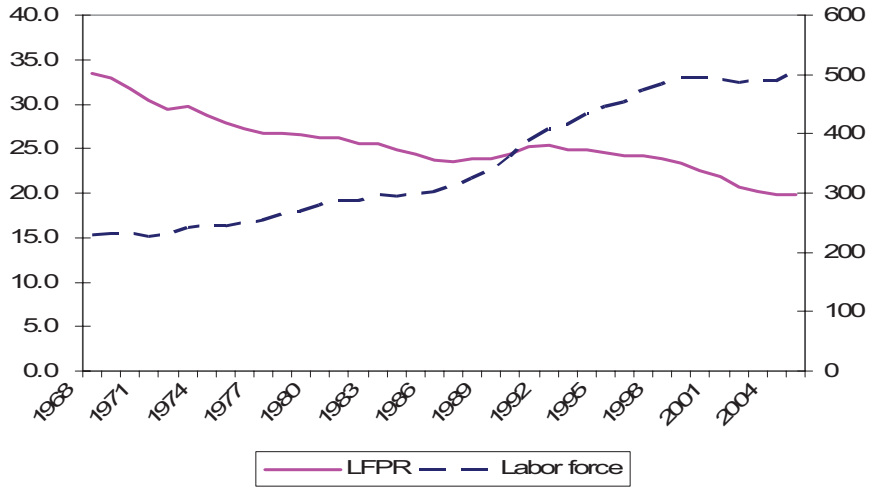
So far, however, the effect on this on the participation of the old in the labour force has been marginal in the aggregate. Figures 4.1e and 4.1f show the labor force population and participation rate of those in the age group 60-64 and those 65 and over, respectively. From the graph, what can be seen is that whereas the portion of the labour force in those age groups is rising sharply, economic activity among them has actually been declining. In the case of those in the 60-64 age group, the participation rate increased sharply from the late 1980s to the early 1990s – the period when enterprises were beginning to shift to a higher retirement age – but it has since fallen and is now at the level it was in the early 1980s.

Figure 4.1e. Labor Force Participation Rate and Population, 60-64: Japan



Source: Japan LFS.
Note: Left hand side axis is in percent while right hand side axis is in 10,000s

Figure 4.1f. Labor Force Participation Rate and Population, 65+: Japan



Source: Japan LFS.
Note: Left hand side axis is in percent while right hand side axis is in 10,000s

employing U_t and NL_t

The lion's share of the policies Japan has undertaken to address its labour shortage problems, heretofore, have to do with encouraging people who are unemployed or not in the labour force, such as the bulk of women, the disabled, and new graduates, to join or rejoin the workforce. The labour force participation rate of women in Japan was at 48.4% as of 2005, much lower for instance than the comparable US figure of 59.2%, leading some to view the increase in their participation as the most effective way to deal the labour scarcity (McDonald and Kippen, 2000).

In 1985, the government enacted the Equal Employment Opportunity Law which expanded employment opportunities for women through the relaxation and partial removal of the protective revisions for them in the Labour Standards Law (JLBb, 1992). The law prohibited discrimination between sexes on the provision of education and training, and in the matter of age limit. The law also extended the maternity leave to prevent women's separation from work due to childbirth. In 1991, the Child Care Leave Law was enacted as another measure to prevent female workers from leaving employment. On their own, enterprises conducted flexible female employment administration to further utilize and attract female employment (JLBc, 1992). The government also increased subsidies for day-care programs and mandated longer hours for its public day-care centers to up to 10 in the evening (NYT, 1991).

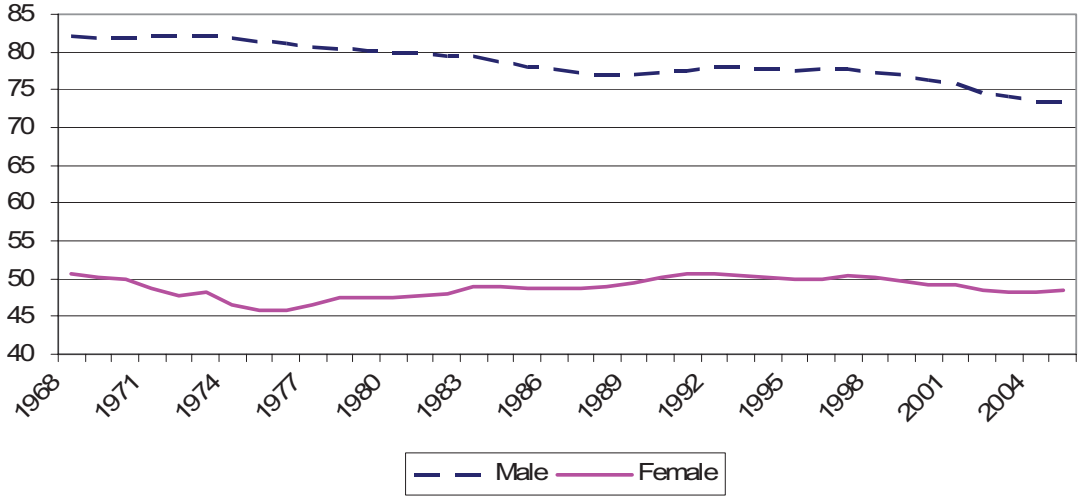
In 1998, the government introduced the Public Insurance System for Long-Term Care, one objective of which is to reduce the burden placed on family members, typically women, in

looking after those who need long-term care (JLB, 1998). Under the system, which began to take effect in 1999, people who are earning and are aged 40 or older are required to pay insurance premiums for long-term care. Local governments serve as insurers and care service is supplied by local government and for-profit private care providers. The system especially seeks to help family carers who are highly skilled and for whom the opportunity cost of providing intensive family care services is very high.

The years 1985 to 1992 saw an increase it the labour force participation rate of women by 2 percentage points from 48.7% to 50.7% (see Figure 4.1g). This means that of the 3.1 million women that have been added to the labour force during that period, 1.1 million was due to greater participation in the group (the rest of the addition came from the growth in the working age population of women). This is more striking as the labour force participation of men actually declined during the period to 77.9% from 78.1%.

The labour force participation of women in the aggregate has been on a downward trend since 1992, however, and was at 48.4% in 2005. If one looks at the labour force participation rate of women by age group, as can be seen in Figure 4.1h, what comes out is that, apart from those in the youngest (15-24) and oldest (65+) age brackets, the participation rate of women has been on an upward trend since the mid-1970s. The rise in participation rate is most striking for those in the 25-34 age group, for whom the participation rate has risen more than 16 percentage points from 1985-2005, and 10 percentage points in the period 1992-2005. On the other hand, the participation rate of those in the 65+ age group has declined from 15.5% to 12.7% in the period 1985-2005 and from 16.7% to 12.7% in the period 1992-2005, while the participation rate of those from 15-24 has declined from 46.5 % to 45.1% in the period 1992-2005.

Figure 4.1g. Labor Force Participation Rate by Sex: Japan



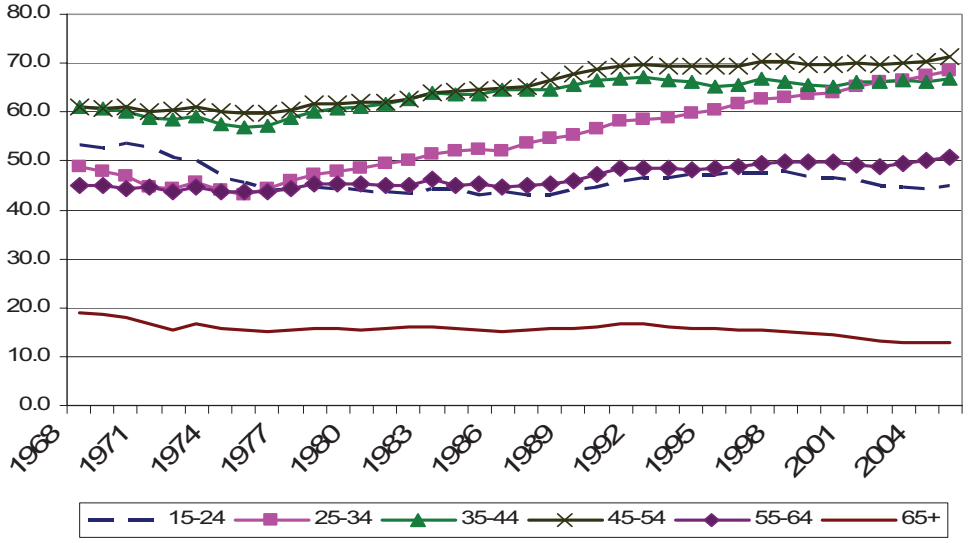
Source: Japan LFS

An evaluation of the effectiveness of the Public Insurance System for Long Term Care in stimulating female labour supply was done by Satoshi *et al.* (2004). The find that by 2002,

two-and-a-half years after its implementation, the system has had a positive effect on female labour supply in households with members who need long term care, increasing the probability of employment by 30%-60%, working days per week by from 40%-60%, and working hours per day by 50%-70%. They conclude that socializing the care burdens spurs female labour supply. The labour force participation of women in the aggregate has been on a continuous decline since 2000, however, and thus, even if effective, the effect is not large enough to be felt in the aggregate.

In general, policies implemented to spur greater labour force participation of women, combined with their rising educational attainment, appear to have been effective in raising the participation of those in the middle-aged group, those between 25 and 54. The effect is most striking for those in the age group 25-34. These gains are offset, however, by the decreasing participation rate of those in the youngest and oldest age groups. The decline in the participation rate of those aged 65 and older is particularly numerically significant as they comprise an increasingly larger share of the total population. There is also a caveat on the increasing participation rate of women in the 25-34 age group, the prime childbearing years. This age group is estimated to account for more than half total births in Japan each year (Jiro, 1991), which means that their contribution to the labour supply now may come at a cost to labour supply in the future.

Figure 4.1h. Female Labor Force Participation Rate by Age Group: Japan



Source: Japan LFS

While not specifically intended as a response to labour shortage problems, policy measures towards the employment of the disabled have had that effect in times of severe shortage and could possibly be viewed as such.[10] Japan has the Law for the Employment Promotion of Persons with Disabilities which legally requires employers to fill a portion of their staff

[10] The objective of the law was a more humanitarian one of expanding employment opportunities and improving the quality of working life of persons with disabilities.

positions with disabled workers. The Law also establishes measures for training and job referral for disabled persons, as well as a levy and grant system designed to financially support the employment of the physically, intellectually, and mentally-disabled (Matsui, 1998). Business establishments with 56 or more permanent employees are required to have people with disabilities account for 1.8% of their workers (JLBa, 2003).[11]

As of 2003, of the estimated 1.5 million people with disabilities of working age, 52% or 780 thousand, were employed (JLBb, 2003). Of course employing people with disabilities could be costly to employers, possibly requiring modification of existing or building new facilities, as well as more supervision or extra training (Matsui, 1993). In fact, that maybe the reason for 57.5% of firms not fulfilling their quota requirements as of 2002 (JLBa, 2003), preferring instead to pay the levy.

increasing E^F

Japan has had a dual approach in accepting migrant workers. Whereas it has welcomed skilled workers, especially professionals and those in the technology sectors, with open arms, it has been reluctant in officially admitting unskilled foreign workers. The government reasons for this reluctance are said to be the worry that doing so will prevent firms, small companies in particular, from innovating, modernizing, improving the working conditions of its workers, and extending employment opportunities to elderly part-time workers (Inagami, 1992).[12] On the other hand, it has allowed unskilled workers through the "backdoor".

As of 2000, the estimated number of foreign workers in Japan was 709,000, roughly 1% of its total labour force of 67.7 million for the period.[13] Of these only 21.8% are professional and technology workers. *Nikejins* or people of Japanese descent (mainly second or third generation Japanese-Brazilians) accounted for 32.9% of the total, while illegal workers comprised a hefty 32.7%. This high figure of illegal workers is interpreted as a failure in the smooth functioning of the foreign labour market (Yoo *et al.*, 2004).[14] That illegal workers have attained such a figure may also be seen as an implicit admission of the government that the economy needs unskilled migrant workers, although it does not want to say so explicitly.

In addition to the officially-classified foreign workers, there is also an estimated 54,000 foreign trainees in Japan as of 2000. It is believed that some of these trainees are actually utilized as workers (Yoo *et al.* 2004).

The control of migrant worker inflows in Japan is governed by the Immigration Act and Refugee Recognition Law, which was enacted primarily in 1951. In 1989, Japan amended this Law to try and measure up more effectively with the intensifying shortage in skilled

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[11] The corresponding rate for national and local government agencies is set at 2.1%.

[12] Inagami (1992) cites a survey of 1,754 employers that indicates that firms undertake these in conjuction with employing migrant workers, or put differently, that they are not mutually exclusive.

[13] Figures for the number of migrant workers are from the Japan International Training Cooperation Organization (2001).

[14] Iguchi (2006) gives a much smaller estimate of those illegally working in Japan at 33,508 in 2001, 32,364 in 2002, 34,325 in 2003, 43,059 in 2004, and 45,935 in 2005.

workers as well as the swelling number of illegal workers.[15] The notable amendments were i) the increase in the number of categories to 28 from 18 under which people can stay legally in Japan; ii) permission given to *Nikejins* to stay in Japan and work in any industry[16]; iii) harsher penalties for foreigners illegally staying and working in Japan and for those employing and assisting such foreigners; and iv) extension of the trainee system for small and medium-sized enterprises under some conditions.

The tension between the evident need of domestic enterprises for unskilled foreign workers and the stated policies of not admitting unskilled foreign workers and stricter penalties for illegal staying and employing them is believed to have only pushed brokers and agents to be more covert, more organized, and to resort to increased human smuggling (Matsuda, 2001). In this sense, the labour response of Japan regarding its shortage in unskilled workers has to be deemed a failure.

More recently, in response to a shortage in care workers, Japan has forged bilateral agreements with both Indonesia and the Philippines to allow nurses and caregivers to work there. Japan will let in as many as 1,000 Filipino nurses and caregivers over a two-year period beginning April 2007 and an as yet unspecified number of Indonesians (WSJ, 2006).

outsourcing and relocating

As a response to labour shortage and the consequent rise in wages and other competitive pressures to minimize costs[17], many Japanese firms have likewise resorted to locating their new plants, or relocating their old ones, to the countryside and overseas (Teresko, 1991; Head and Ries, 2000). The government passed the Local Employment Development Promotion Law in 1988 to motivate firms to transfer production to local regions of relatively high unemployment from labour shortage regions. The Law provided subsidies to firms creating new or additional establishments in designated areas. Alongside this, many Japanese companies have shipped production capacity to lower-wage economies, mainly in Southeast Asia and more recently in China (Figure 4.1i). As of 2006, Japan is said to have already shipped more than 40% of their production capacity overseas.[18] Offshore production expansion by Japanese multinational companies is believed to have increased the productivity of these firms and has shifted the labor demand in Japan towards higher-skilled workers (Head and Ries, 2000). Neither that or the regional employment law did away with the shortage of workers in 3-D jobs, however. Undocumented migrant workers continued to fill these jobs, particularly in the construction industry, where foreign direct investment or mechanization is not an alternative (Inagami, 1992).

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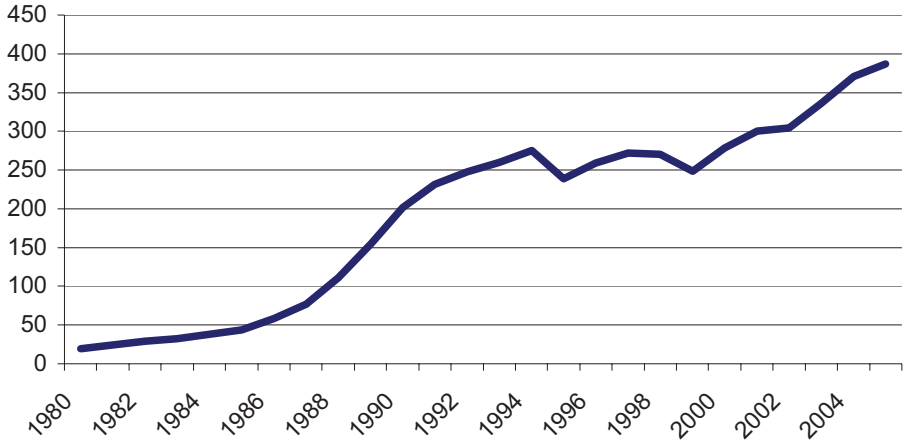
[15] The Act was previously revised in 1965 to give South Koreans in Japan the right of permanent residence and in 1981 to allow refugees and returnees from China to apply for permanent residence, as well as to give foreigners with the status of permanent residence to apply for social security (Matsuda, 2001).

[16] The amendment concerning the *Nikejins* in effect gave them permission to be employed as unskilled workers. But their numbers were insufficient to meet the strong demand, particularly from smaller enterprises, thus creating what may be considered a dual market for unskilled foreign workers, one for the Nikejins and the other for illegally working or staying Asian-African foreign workers who get paid less (JLBa, 1992).

[17] External pressures to outsource include greater global trade intensity, technological advances, and the appreciation of the Yen.

[18] From USA Today 3 May 2006 article 'Wave of retiring workers could force big changes; Aging nation could recruit more women or foreigners' written by Paul Wiseman and citing an executive from Merrill Lynch.

Figure 4.1i. Outward FDI Stock, Japan (US$ Bn)



others

To address long-term population and labour supply problems, Japan has instituted monetary incentives for families with more children. Beginning 1991, the Japanese government gave families a grant of 5,000 yen a month for each child of pre-school age and 10,000 a month for a third child. This policy does not appear to have worked, however, as the number of births continued to trend downward up to 2005.[19]

4.2. Korea

Korea's response to the shortage has mainly taken the form of automation, relocation, open admission of skilled foreign workers, and the – until recently – reluctant admission of unskilled foreign workers.

raising K and A

Korea undertakes massive domestic investments. The country has one of the highest investment ratios in the world and from the 1970s to 2005, growth of fixed capital formation in the country averaged 9.3% annually (see Figure 4.1a). Research and development expenditure in Korea is also high at about 2.5% of GDP and the number of research and development workers per million people among the highest in Asia at 3,000 (Figures 4.1b and 4.1c).[20] This has resulted in labor productivity growth averaging 4.6% annually for the period (see Figure 4.1b), roughly 2.5 times the comparable figure for Japan and the US. Without such rapid labour productivity growth, it is safe to say, the labour shortage in Korea would have been much more intensive.

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[19] The birth rate actually increased from 2005 to 2006 but is still expected by the Ministry of Health to continue to drop in the future (BBC, 2007).

[20] A survey by Abella and Park in 1994 of 240 small and medium firms in and around Seoul found 13% of them had undertaken automation as a response to labour shortage. The figure is probably higher for larger firms because of economies of scale considerations.

extending E_t

In a survey of 240 small and medium sized firm in 1994, Abella and Park (1994) found only a quarter of the firms planning to respond to labour shortage problems by asking existing employees to work overtime. Korea has only recently mapped out plans to extend the retirement age and to provide better employment opportunities for older workers. Under its First Basic Plan on Low Birth and Aging Society (also known as Saeromaji 2010) announced in 2006, the Korean government promised to enact laws banning age discrimination and to provide the conditions for extending the retirement age such as through changes in the wage regime (KOILAF 2006). As these plans have yet to take effect, their effectiveness could not be properly evaluated but similar policies, for example in Japan and Singapore, have had limited success in raising the participation rate of older workers.

employing U_t and NL_t

Under the same First Basic Plan on Low Birth and Aging Society, the government plans to ease the entry and re-entry of women into the labour force by increasing the number of national and public childcare centers, easing the conditions for childcare leave, increasing leave benefits, allowing shorter working hours for parents with infants, and introducing systems to support re-employment after gaps in employment due to childbirth or child raising (KOILAF 2006). Under the Plan, the government also plans to expand the scope of the Employment Equality Plan, which sets a quota for women employees, to cover by 2008 enterprises with 500 or more employees from its current coverage of enterprises with 1,000 or more employees.

increasing E^F

Korea, like Japan, values the homogeneity of its country and its policies towards accepting migrant workers are similar in form to Japan's if not in the details, such as the trainee system, and the relaxed admission policies for specific categories of skilled workers and people who originated ethnically from the country

As in Japan, skilled migrant workers in specific categories are welcomed and given the same rights as local workers. Korea's Immigration Act allows for the lawful employment of skilled migrant workers under the following seven categories: professors, language instructors, researchers, technology instructors, specialists, arts and entertainment workers, and people engaged in special activities. In 2000, the government further eased regulations and legal residence requirements for migrant labor in the field of state-of-the-art technology, granting them multiply entry visas, extending their maximum length of stay, and allowing them more flexibility in the activities they can engage in (Yoo, 2004).

The country has not been as welcoming to low-skilled workers. In 1991, the government introduced the Industrial Trainee program for Korean firms that are invested overseas, allowing the head office to bring over workers from their overseas subsidiaries for training and then relocation back to their original posts.[21] Trainees were permitted to stay for up to one year. In 1993, because of demand from small and medium-sized manufacturing firms

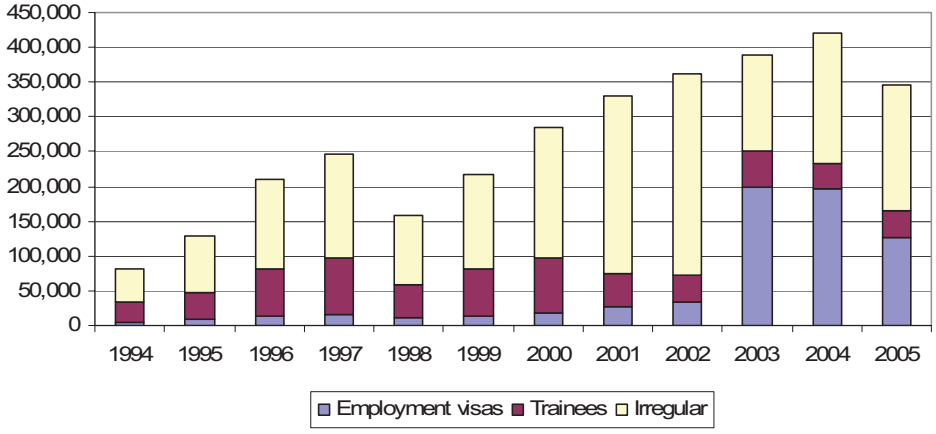
[21] Details of the policies are sourced from Yoo *et al.* (2004).

suffering from labour shortage for similar treatment, the Industrial Trainee program for foreigners was introduced in 1993. Under this program manufacturing firms with 300 or less workers are allowed to bring in foreigners as trainees for a period of up to two years. In 1996, this program was modified twice, first in 1996 to also cover coastal fisheries, then in 1997 to cover the construction industry.

The trainee system came under heavy criticism because most of the trainees were in reality workers and classifying them as such only denied them their proper rights as workers, including just compensation (Yoo *et al.*, 2004).[22] The incentive for trainees to leave and find better paying illegal work was strong and the likelihood of being caught low[23], leading to a ballooning in the number of illegal workers up until 2002 (see Figure 4.2a). Irregularities in the sending procedures of private agencies and even human rights violations are other problems believe to have resulted from the trainee program (Ministry of Labor, 2006).

As a response to the criticisms, the government introduced in 2000 the Post-training Employent Program granting trainees who have worked for their firms for two years without interruption the permission to reside and work in Korea for one more year as an employee. In 2002, the training period requirement was reduced to one year and the time allowed for regular employment extended to two years.

Figure 4.2a. Migrant Workers in Korea by Status



Source: Ministry of Justice, Korea

In 2001, the government introduced the Employment Management Program for foreigners of Korean ethnicicty. This resembles the Japanese government program on *Nijekins* except that only those 40 years of age and over and had close relatives in Korea were admitted, and

[22] Some later government measures actually aimed at improving the conditions of trainees such as the Guidelines for the Protection and Management of Foreign Industrial Trainees which made legal and social welfare arrangements to protect migrant workers. Additionally, beginning 1995, industrial trainees became eligible to receive Industrial Accident Compensation Insurance and National Health Insurance. The Labor Standards Act and Industrial Safety and Health Act also partially began to be applied to trainees.

[23] From the late 1980 up to 2002, the Korea government is said to have implemented more than 10 deportation programs, none of which was successful (Park, 2004).

they were limited to six areas of the service industry, namely restaurant business, business support services, social, welfare services, cleaning, nursing, and housekeeping for up to three years. In 2003, the minimum age was lowered to 30.

As in Japan, the policy brought in some foreign workers for the 3-D jobs but in numbers inadequate to meet the demand. As a result, the number of irregular workers continued to climb up to 2002, leading the policy and all preceding ones to be considered failures (Yoo, 2004).

In 2003, the government introduced the Act Concerning the Employment Permit for Migrant Workers under which low-skilled foreign workers may be employed as employees, not as trainees.[24] Alternatively called the Employment Permit System (EPS), the Act permits specific categories of enterprises that wish to employ foreign workers to do so upon obtaining a permit from the Ministry of Labor if they are unable to find Korean workers. The period of an employment contract for a migrant worker shall be one year but may be extended to a maximum of three years. The EPS subsumes the Employment Management Program. The trainee systems will be phased out by the beginning of 2007.

Under the EPS, the number of foreign workers to be received, their fields of employment, and the sending countries are determined by the Foreign Workers Policy Commission. Employers covered by the EPS are those with fewer than 300 employees in manufacturing, construction, agriculture and livestock industry, and six areas of the service industry (restaurant business, business support services, social welfare services, cleaning, nursing, and housekeeping). Agreements are made directly with the labor ministries of sending countries, for which those currently selected are China, Mongolia, Philippines, Vietnam, Indonesia, Thailand, Sri Lanka, and Kazakhstan.

Workers covered by the EPS have the same rights as local workers, are allowed to join the trade union, are required to join the Employment Insurance System, Industrial Accident Compensation Insurance System, National Health Insurance System, and National Pension System, and could have unemployment insurance coverage if they desire.

While the jury is still out on the longer term effect of the EPS, it is worth noting that two years after it took effect, the number of undocumented workers has stabilized at around 180,000. In a survey of firms conducted by the Ministry of Labour (2006), majority (60.7%) said it has reduced runaway rates and 65% believe it has helped improve foreign workers's rights.

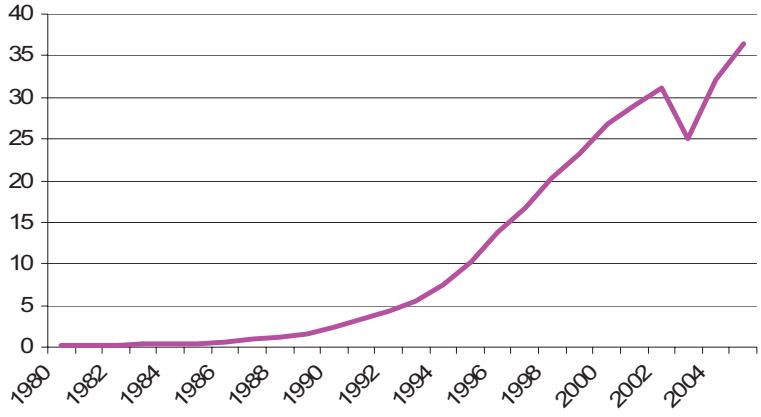
outsourcing and relocating

Korea has also undertaken massive foreign direct investments, especially after the appreciation of the Won in the late 1980s, which allowed the domestic economy to shift from being industry-dominated to services-dominated (Lee, 2002). Similar to Japan, FDIs

[24] Prior to this, the government undertook legalization programs for undocumented workers, permitting undocumented foreign workers who had been in Korea for less than four years to stay longer. This is the reason for the drastic reduction in the number of undocumented foreign workers in Figure 9 from 2002 to 2003.

from Korea went mainly to Asian manufacturing export countries (Figure 4.2b). As in Japan, it is safe to say that if not for the massive offshoring beginning the late 1980s, labour shortage, especially at the lower skill levels, will be even more severe.

Figure 4.2b. Outward FDI Stock, Korea (US$ Bn)



others

Partly as incentives to try and improve fertility rates, the government, under the First Basic Plan on Low Birth and Aging Society, plans to expand monetary childcare support to low-income households to eventually also cover middle-class households, to provide monthly child allowances of KRW 100,000 to all second born children beginning 2007, and to reform the health insurance system, the national pension system, and the housing system to favor households with multiple children (KOILAF 2006). Again, since these policies have yet or have just taken effect, their effectiveness cannot be properly evaluated but similar monetary incentives to increase fertility in other countries have not worked.

4.3. Singapore

Singapore has had extensive experience dealing with labour shortage having relied on foreign workers for needed labour for much of its pre-independence and post-independence history. A desire to attract and integrate high-skilled workers and to phase out reliance on low-skilled workers underpins much of its recent policy responses to its labour shortage.

raising K and A

Singapore's investment-to-GDP ratio is one of the highest in Asia at about a quarter of its GDP in recent years. From its independence in 1965 to 2005, gross fixed capital formation has averaged an annual growth of about 8 percent (Figure 4.3a), the highest among the five economies considered in this paper for the comparable period. To actively encourage investments in automation, Singapore charges a levy for the employment of low-skilled workers (ASJ 1991; see migration subsection below). As a result, labour productivity in Singapore is one of the highest in the region and has averaged a growth of 4.7% annually since 1965 (Figure 4.3b). The number of research and development workers in Singapore

per million people is second only to Japan in Asia at about 4,350 and research and development expenditure as a % of GDP is substantial at 2.2% (Figures 4.1b and 4.1c).

As in Korea, without such high-level investments, one can imagine that labour shortage, particularly among low-skilled workers, will be even more severe.

Figure 4.3a. Growth in Fixed Capital Formation, Singapore

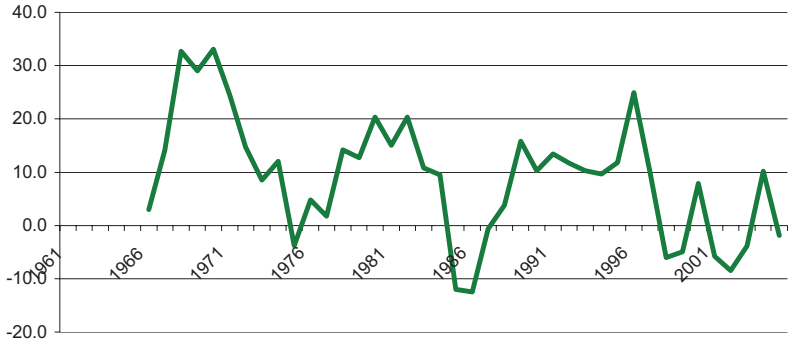
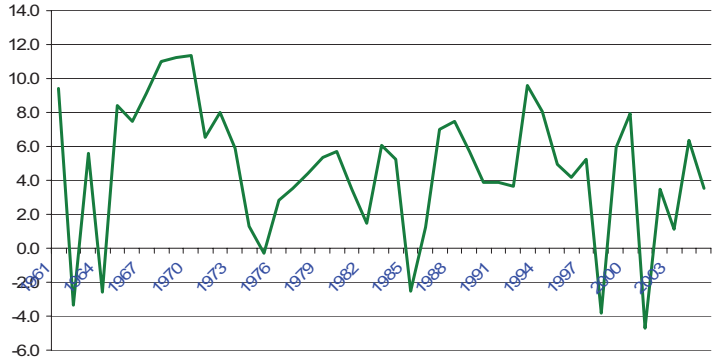


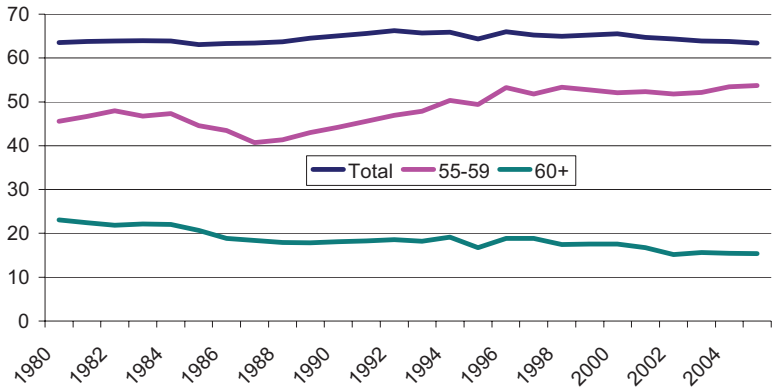
Figure 4.3b. Growth in Labour Productivity, Singapore



extending E_t

Singapore raised mandatory retirement age in 1993 to 60 years from 55, previously. This appears to have been effective in raising the participation rate for the main affected age group of 55-59 from 48% in 1993 to 54% in 2005. But this has been largely offset, however, by a decline in the same period in the participation rate of those 65 years old and above, from 66% in 1993 to 63% in 2005, whose share in the total population is expanding. According to Kalijaran and Shantakumar (1998), probable reasons why participation rate for the elderly has been declining are the lingering effects of past mandatory retirement laws, universal home equity, and provident fund withdrawal eligibility at 55. In addition, mismatch between jobs created in the new economy maybe unsuited to the skills of the older Singaporeans, with majority of older Singaporeans not having any formal educational attainment (Kalijaran and Shantakumar 1998). The retirement age was further increased to 62 years in 2000 and is expected to be raised further to 67 in the next few years.

Figure 4.3c. Elderly Labour Force Participation Rate, Singapore



employing U_t and NL_t

Singapore has instituted various policies to help the unemployed and those not in the labour force to obtain gainful employment, including the creation of the Skills Development Fund to provide for the training needs, not only of current workers but also those in retirement and who desire to re-enter the labour market (Kalirajan and Shantakumar 1998). The government has also actively encouraged housewives (apart from retirees) to enter the workforce to mitigate labour shortage (The Oregionian 1990), even if just to take part-time jobs (LA Times 1987). The Ministry of Manpower actively encourages companies to make available part-time work programs for housewives and retirees. According to Gross (1999), much of the labour force growth observed in the late 1990s was due to increased numbers of married women and older workers participating, apart from increased foreign workers. The work permits extended to domestic workers is also explicitly meant to facilitate the increase in the labour participation of Singaporean women (Yeoh 2007).

As maybe seen in Figure 4.3d, there has been a substantial increase in the labour force participation of women compared to its level in the early 1980s. However, overall female labour force participation has been relatively stagnant since the 1990s and has been stable at about 50 percent in recent years. If one looks at the breakdown of female labour force participation by age group (Figure 4.3e), however, one can see that there has been a more or less continuous increase in labour force participation across all age groups except the youngest and oldest age groups. For the former, increasing enrollment in post-secondary education is the main reason for declining participation. The declining participation among elderly women is significant, however, as they comprise an increasing share in the country's ageing population.

Figure 4.3d. Labour Force Participation Rate by Sex, Singapore

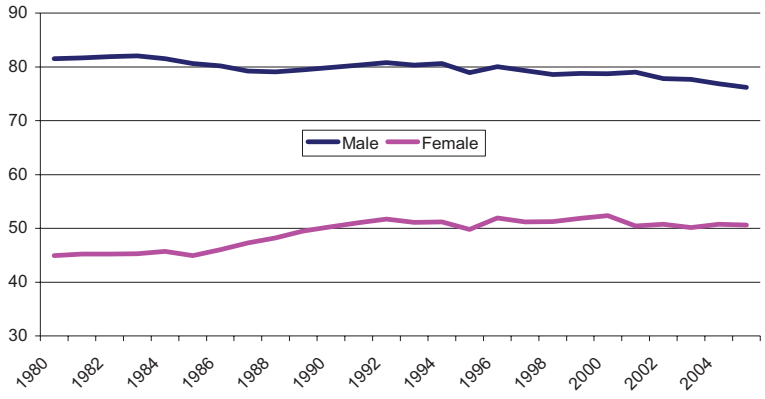
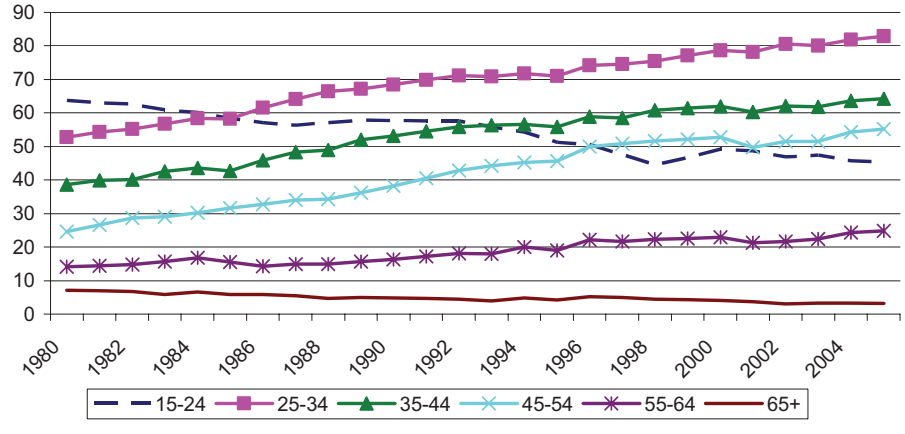


Figure 4.3e. Female Labour Force Participation Rate by Age Group, Singapore



increasing E^F

Singapore relies mainly on foreign workers to address its labour shortage problems.[25] As of 2000, migrant workers are estimated to comprise 29% of Singapore's total labour force. According to Yeoh (2007), there were about 670,000 nonresident workers in Singapore in 2006, of which 90,000 are skilled workers and 580,000 lower-skilled workers. Just like Japan and Korea, Singapore openly welcomes skilled workers and encourages them to permanently reside in the country but is strict with lower-skilled workers, instituting various measures to limit their presence and ensure that their stay in Singapore is only temporary. Singapore manages lower-skilled workers through the work-permit system, the dependency ceiling, and the foreign worker levy (Yeoh 2007).

[25] Although at various times in the past, the government would announce a phaseout of foreign workers, particularly low-skilled ones. An example is Lee Kuan Yew's pronouncement in 1983 of a phaseout of foreign workers by 2000.

Singapore offers, through the Ministry of Manpower, different types of work passes for foreign workers of different skills. For foreign professionals, managers, executives, and specialists, Singapore has the Employment Pass (P and Q Pass). Employment Pass applicants must be minimally paid a basic monthly salary of $2,500,[26] in addition to being evaluated on the basis of qualifications, work experience, nature of job, etc. Beginning January 2007, Singapore has also offered the Personalised Employment Pass. This is available to applicants who have earned at least S$30,000 in the previous year and in addition must have held a P Pass for two years or a Q pass for 5 years.

For mid-level skilled workers, Singapore has the S Pass. S Pass applicants must have a minimum salary of S$1,800 and will be evaluated based on other qualifications such as skills, work experience, and job type. A company can only have at most 10% of its employees as S Pass holders, and it has to pay S$50 for each S Pass holder. If an S Pass holder earns more than $2,500, he can bring with him dependents.

For semi-skilled and unskilled foreign workers that do not meet the requirements for an S Pass, Singapore has the Work Permit (R Pass). Domestic workers are also given R Passes. Country restrictions apply by industry and dependency ceilings apply. For example, in manufacturing Work Permits may not be given to workers from Indonesia, Thailand, Sri Lanka, India, Bangladesh, Philippines, and Myanmar and the company has to pay a monthly levy of S$330 per worker if its dependency ratio is below 40% and S$400 if its dependency ratio is above 40% but below 50% - the maximum allowed (Ruppert 1999).

Judged by its high productivity growth and the low number of its irregular migrants (Table 4.3a) – less than 2 percent of total migrants even if overstayers are included – one may say that Singapore's migration policy has been effective in alleviating labour shortage. Singapore, of course, has the advantage of being a small city-state with a credible government, so that threats of punishment for illegal entry and stay are more effective.[27]

But some concerns still arise with the reliance on foreign workers in the country such as, according to Hui and Hashmi (2004), "increased income inequality arising from wage depression at the lower end of the wage distribution, high costs of enforcement measures, the political hurdles of cultivating national identity in the face of an influx of foreigners, and an increased emigration tendency among citizens." Ruppert (1990) also cites the presence of large informal economies staffed mostly by illegal aliens as evidence of policy shortcomings.

Table 4.3a. Illegal migrants and overstayers in Singapore 2000-2005

Year	2000	2001	2002	2003	2004	2005
Overstayers	4,900	5,600	5,690	6,340	6,400	5,500
Illegal Immigrants	11,600	10,400	7,860	5,510	5,400	4,600

*Source: Presentation by Prof. Brenda Yeoh for NEAT Working Group Meeting on an East Asian Cooperative Framework for Migrant Labour 6-7 December 2006 Kuala Lumpur

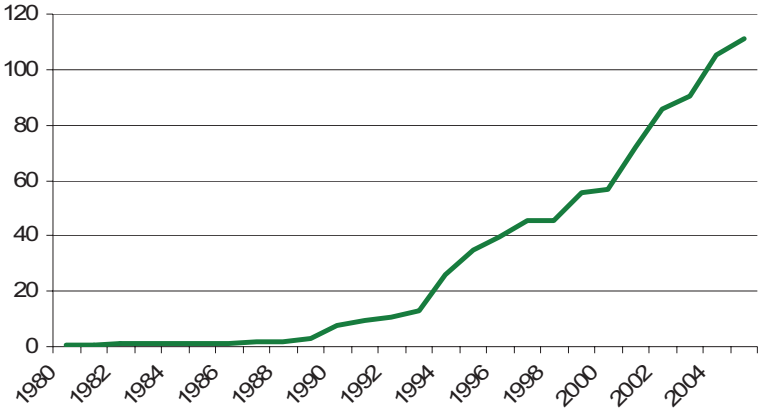
[26] The salary requirement boundaries have changed over the years for the different work passes.

[27] Illegal entrants to the country face a jail sentence of up to 6 months plus minimum of 3 strokes of the cane, or in lieu of caning, a fine of up to S$6,000. Harbouring or employing illegal immigrants carries a jail sentence of six months to two years and a fine of up to S$6,000. Employing more than five illegal workers carries the additional punishment of caning (Yeoh 2006).

outsourcing and relocating

Beginning in the 1990s, Singapore poured a lot foreign investments in neighboring Indonesia and Malaysia (mainly in Batam Island and Johor, respectively), taking advantage of the two countries' relatively cheaper labor in a deliberate attempt to transfer more labor intensive industries offshore (LA Times 1991; ASWJ 1991). In 1991, monthly wage of a factory worker in Malaysia was only 80 percent that in Singapore, whereas that in Indonesia was only 14 percent that in Singapore. Singapore has been the third largest investor in Malaysia, after Japan and Taiwan. Figure 4.3f shows the rapid rise in Singapore's outward FDI beginning in the 1990s.

Figure 4.3f. Outward FDI Stock, Singapore (US$ Bn)



others

To address long-term labour shortage issues, the Singapore government has instituted various policies to try and raise the fertility rate starting with New Economic Policy in 1987 which included tax-incentives for having a third and fourth child – a departure from its "Stop at two policy" in the previous decades. Policies also include the special rebates for women who give birth to their second child before a certain age, child care subsidies for the first three children of working mothers, and priority in registration in primary schools and selection of Housing Development Board flats for three-child families (Hui and Hashmi 2004). In 2000, the government introduced the Baby Bonus Policy which gave cash gifts for the second and third child as well as a matching contribution by the government for amounts paid by parents into the Child Development Account, which can be used to pay fees at child care centers (Hui and Hashmi 2004). In 2004, additional policies to boost fertility, including longer maternity leave and infant care subsidies were introduced (Yeoh 2007). In all these years, fertility rate continued to decline in the country (Figure 2.3a).

Singapore's move to develop itself as an international education hub for primary-to-university-level students maybe viewed also as a means of accessing talent in the future. In this there is some evidence that Singapore has so far been successful. According to Yeoh

(2007), the country had 66,000 foreign students in 2005 and is targeting 150,000 students by 2012, mainly from China, India, and neighboring Southeast Asian countries.

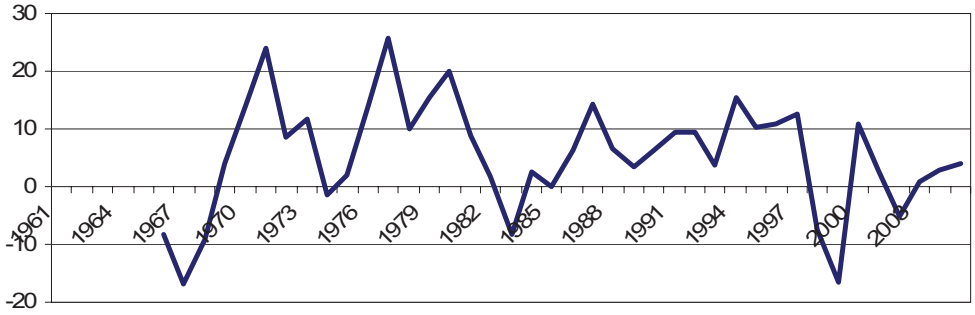
4.4. Hong Kong

Offshoring, migration, and retraining of its workers have been Hong Kong's main response to labour shortage. Hong Kong undertook massive offshoring of its manufacturing enterprises to mainland China beginning in the late 1970s to accomplish the dual objectives of addressing its labour shortage in lower-skilled workers and at the same time improving its export competitiveness by utilizing the much cheaper labour in the mainland. As it has transformed into a higher-end service sector economy, like Japan, Korea, and Singapore, it has opened its doors to skilled migrant workers, while at the same time allocating a large portion of government budget on the education and training of its workers.[28]

raising K and A

Whereas the growth in gross fixed capital formation has generally been positive for Hong Kong from the mid-1960s to the present, its average growth for the period of 5.5% is lower than that for the four other economies considered in this paper (Figure 4.4a). Hong Kong also has the lowest research and development expenditure as a percentage of GDP among the five economies and is better only than the still industry-sector dominated Malaysia in terms of the number of research and development workers per million people (Figures 4.1c and 4.1d). The data suggests that investments in automation and technology have not been major avenues by which Hong Kong has tried to address its labour shortage problems over the last three decades.

Figure 4.4a. Growth in Fixed Capital Formation, Hong Kong



extending E_t

To ensure the continued employability of its workers despite the changing structure and needs of its economy, the Hong Kong government funds various training programs for

[28] For fiscal year 2006-07, recurrent government expenditure on education accounted for 20% of total recurrent government expenditure (CSD-CSDQL 2006).

them.[29] The government provides an annual grant to the Employees Retraining Board which offers training to about 100,000 eligible workers each year to train them in new or enhanced skills to improve their employability (CSD-CSDQL 2006).[30] In addition, the government set up in 2001 the Skills Upgrading Scheme with an initial budget of HK$400 million and in 2002 established the HK$5-billion Continuing Education Fund, which subsidizes the education and training of interested adults in specific sectors and skills domain (CSD-CSDQL 2006).[31]

The results appear to be mixed. While unemployment has been on a decline from 7.9% in 2003 to 4.8% in 2006, corresponding also to stronger economic growth in the territory, this is still way above the 1.3% unemployment rate in the country in 1990 – and this despite the existing considerable shortage in skilled labour. This means that the training programs, while they may have achieved some success, still have a long way to go into completely adapting workers to the changing skills needs of the Hong Kong economy. Unemployment is particularly higher among those displaced from the manufacturing sector (Census and Statistics Department website, HK).

employing U_t and NL_t

Hong Kong has three major agencies – the Labour Department, the Social Welfare Department, and the Education and Manpower Bureau – that provide programs to enable the unemployed and those not in the labour force to find employment. The Labour Department, for instance, has launched the following programs in the past few years: Youth Pre-employment Training Programme in 1999 targeting young school leavers aged 15 to 19; Youth Work Experience and Training Scheme in 2002 targeting people aged 15 to 24 with education below degree level; Employment Programme for the Middle-aged in 2003 targeting the unemployed aged 40 years and above; and the Work Trial Scheme targeting job-seekers who have special difficulties finding jobs (Commission on Poverty 2006). The Education and Manpower Bureau, meanwhile, mainly focuses on providing retraining courses for the unemployed aged 30 and above who finished no higher than junior secondary education level (Commission on Poverty 2006).

Figure 4.4b gives the unemployment rate by age group for both sexes from 1982 to 2006. It can be seen that for all age groups, unemployment rate has been declining since around 2002-2003, coinciding with the implementation of the employment programs. But again it must be noted that it is difficult to separate the effect of the programs from the general recovery of the Hong Kong economy from its sluggish growth in 2001-2002. Moreover, it is very clear from the graph that unemployment, especially for the age group 15-19 is substantially higher than it was in the 1990s.

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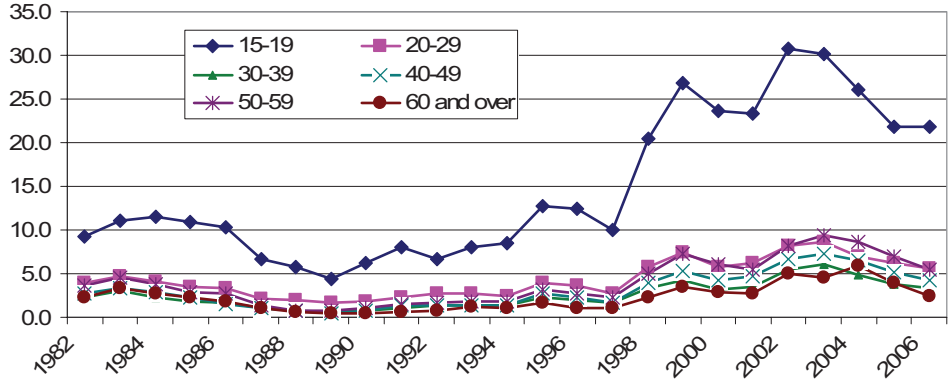
[29] These training programs for currently employed workers are also available for those who are unemployed or out of the labour force and may thus be considered also as part of the policies for *employing U_t and NL_t*.

[30] The grant for fiscal year 2006-7 is over HK$350 million (CSD-CSDQL 2006).

[31] According to CSD-CSDQL (2006), as of February 2006 over 260,000 applications have been received.

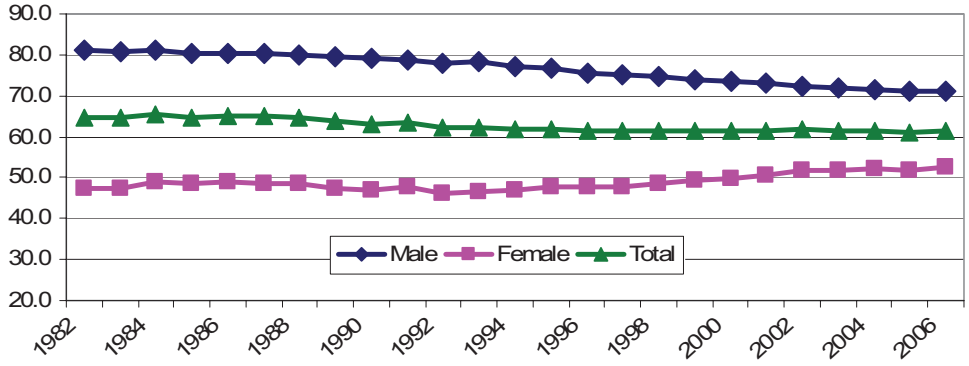
Figure 4.4b. Unemployment Rate by Age Group, Hong Kong



Just as in Singapore, Hong Kong's policy of admitting foreign domestic workers is also explicitly meant to facilitate the entry into the labour force of the local working age female population (Hewison 2004; Chan 2005). There are more than 200,000 domestic workers in Hong Kong coming mostly from the Philippines and Indonesia. In 2006, to tap another potential source of skilled labour, the government gave spouses of non-mainland expatriates the automatic right to work in the territory (Birmingham Post 2006).

Figure 4.4c shows labour force participation by sex for the Hong Kong territory from 1982 to 2006. It shows male labour force participation declining 10 percentage points in the period from 81% to 71%. On the other hand the female labour force participation has increased 5 percentage points to 53% from 48% in the same period, enabling overall labour participation to remain at an almost constant level since 1997 at around 61%.[32] Female labour participation rate in Hong Kong is higher than in Japan and Singapore.

Figure 4.4c. Labour Force Participation Rate by Sex, Hong Kong



[32] Female labour participation in Hong Kong was at 37% in 1961 (Hewison 2006 citing Athukurola and Manning 1999).

increasing E^F

From the time when it was mainly an exporter of manufacturing goods up to the present when it has shifted to the provision of trade and financial services, Hong Kong has been heavily dependent on the influx of migrant workers – mostly from mainland China[33] – to ease its labour shortage.[34] For instance, between 1978 and 1981, near the peak of its manufacturing export boom, net immigration from China totaled 600,000 (Yip *et al.* 2001). This was facilitated by the "touch base" policy in effect at that period but abolished in 1981 which granted residence rights to immigrants from China who arrived at the southern part of Kowloon or Hong Kong Island (Yip *et al.* 2001). With unemployment rate hovering at about 4% at that time, immigration helped ease the shortage in workers, especially in the lower skill levels, in that period.

In recent decades, labour shortage in Hong Kong has been more acute for high-skilled workers and it has adjusted its policies accordingly. In 1993, Hong Kong, still under the United Kingdom, launched a pilot scheme to bring 1,000 mainland professionals into the territory to fill in technical positions in local companies and to help facilitate the transition with China (Cangbai 2007). In 1999, Hong Kong launched the Admission of Talent Scheme and in June 2001 the Admission of the Mainland Professional Scheme. These programs proved inadequate, however, in meeting the huge demand for mainland professionals, partly because they set too rigid restrictions on the qualifications of the applicants and they did not allow successful applicants to bring their dependents to the territory (Skeldon 1994; Cangbai 2007).

From July 2003, skilled workers from the mainland have been allowed to apply for work in Hong Kong through the Admission Scheme for Mainland Talents and Professionals, which also allows successful applicants to bring along their spouses and dependents to the territory. Professionals from other countries can also apply to work in Hong Kong through its General Employment Policy. In recent years, some 20,000 to 25,000 professionals are admitted into Hong Kong through these two programs (CSD-CSDQL 2006). In addition, since August 2001, students from the mainland who have graduated with degree level from tertiary institutions in Hong Kong have been allowed to apply to stay in Hong Kong to work (CSD-CSDQL 2006). However, as of early 2006, only about 650 mainlanders have been admitted under this scheme (CSD-CSDQL 2006).

In July 2006, the government introduced the Quality Migrant Admission Scheme to allow foreign professionals satisfying age and skill requirements to live in Hong Kong even without a prior job offer (CSD-CSDQL 2006; Birmingham Post 2006). The program targets to admit about 1,000 professionals a year (Birmingham Post 2006). Cangbai (2007) reports that while it is still too early for a definitive evaluation of the program, from July 2006 to February 2007 it has had limited success, as only 149 applications have been approved,

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[33] While Hong Kong has been returned to the sovereignty of China since 1997, mainland Chinese who transfer to Hong Kong for work are considered as migrant workers in this paper.

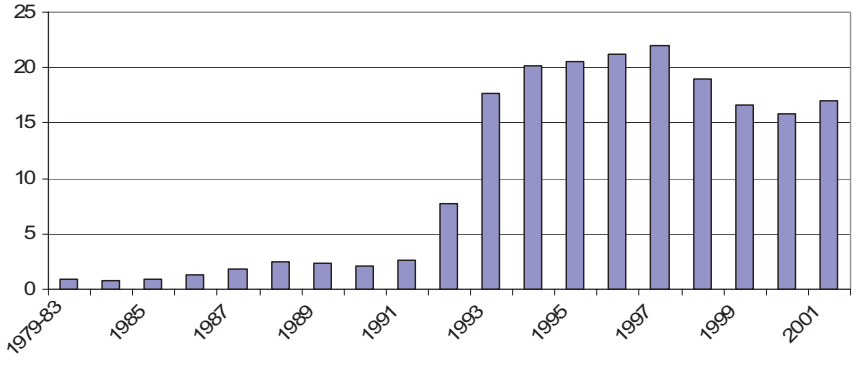
[34] Yip *et al.* (2001) reports that the median age in Hong Kong was at 26.3 years in 1981 and at 35.3 years in 1998, and that without the constant migration in that period, the territory would have aged much faster.

which is way below the annual target. Most of the approved applications were from mainland China.

outsourcing and relocating

Hong Kong is the prime example of an economy that deindustrialized – and solved its shortage in lower-skilled manufacturing workers – through relocation. From the late 1970s when China started to welcome foreign direct investments, Hong Kong firms began relocating their manufacturing operations to southern Chinese provinces, mainly to Guangdong (Imai 2001; Zhang 2005). Relocation further intensified beginning 1992, following further economic reforms in the mainland.[35] Figure 4.4d shows the flow of foreign direct investment from Hong Kong to China from 1979 to 2001.[36] By the mid-1990s, 80% of Hong Kong manufacturers have transferred production to mainland China and between 3 and 4 million people there were directly or indirectly employed by Hong Kong firms (Ho 1996). In contrast, at the same time, there were less than 400,000 workers employed in the manufacturing sector in Hong Kong (Ho 1996). The manufacturing sector's employment share fell from 40.2% in 1984 to 11.6% by 1997 (Imai 2001). There is no question that the FDI flows eased the labour shortage in Hong Kong where unemployment rate hit an all-time low of one percent in 1990.

Figure 4.4d. Hong Kong FDI Flow to China (US$ billion), 1979-2001



Source: Zhang (2005)

[35] Among these is a more liberal investment environment. China initially welcomed only FDI that are export-oriented, for offshore oil exploration, or for tourism but beginning 1992 also opened its doors to FDI targeted at the domestic market (Zhang 2005).

[36] By the end of 1997, Hong Kong's share in the cumulative realized FDI in China was estimated at 54% or US$120 billion (Imai 2001). It must be noted, however, that a portion of these maybe FDIs by other countries using Hong Kong as base (Imai 2001).

others

Hong Kong has in place several instruments to try and encourage couples to have more children and ease future labour shortage concerns. The government grants uniform tax deduction for each children up to a maximum of 9, provides pre- and post-natal care and advisory services for maternity, child rearing, and parenting, and support non-government organizations in the provision of day care centers for children (CSD-CSDQL 2006). The territories employment laws also provides for maternity leave and pay, protection against termination of employment for reasons of maternity, as well as prohibition of assignment of heavy, hazardous or harmful work for pregnant women. The government is also reported to be considering granting one-time payments to parents of new-born babies to improve fertility rates (CSD-CSDQL 2006). With the world's lowest fertility rate that is still declining, it does not appear that such measures have been effective.

4.5. Malaysia

As has been noted earlier, Malaysia differs from the four other economies considered here in that it is still dominated by the manufacturing sector and fertility rate, while declining, is still significantly above the replacement level. Immigration and active encouragement of the local population to join the labour force have been the main policies of the country to address its labour shortage.

raising K and A

Growth in fixed capital formation has been strong in Malaysia, averaging about 9.2% annually since the 1960s (Figure 4.5a). It was particularly strong from the late 1980s to just before the Asian crisis when it grew at an average of 19% per year. Investments did not appear to be particularly targeted to labour-saving technologies or automation, however, but rather just for typical production expansion. Growth in labour productivity in the country from 1981 to 2003 has only averaged around one percent annually (Figure 4.5b), less than one-fourth the level for Singapore and Korea. Moreover, Malaysia has the second lowest research and development expenditure-to-GDP ratio of the five economies considered here at only 0.7% - less than one-third of Singapore's and less than one-fourth of Japan's corresponding figures (Figure 4.1c). It also has the lowest number of research and development workers per one million people at only 295 – one-fifth of Hong Kong's and one-fifteenth of Singapore's corresponding numbers (Figure 4.1d). Narayanan and Wah (2000) notes that "the spectacular transformation of Malaysian manufacturing appears to have been achieved without a concomitant growth in research activity, either indigenous or transplanted."

Figure 4.5a. Growth in Fixed Capital Formation, Malaysia

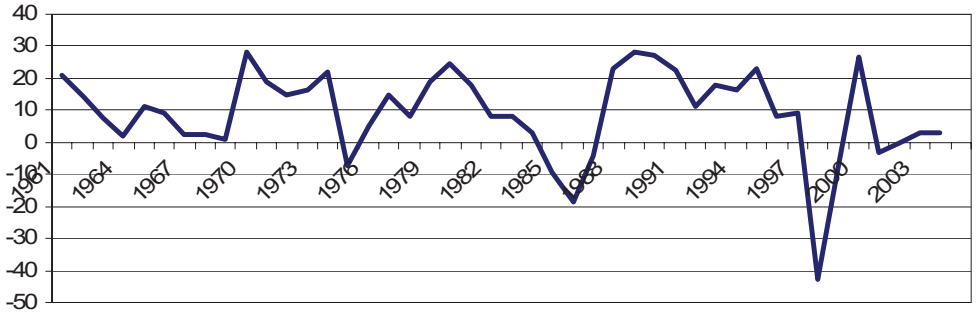
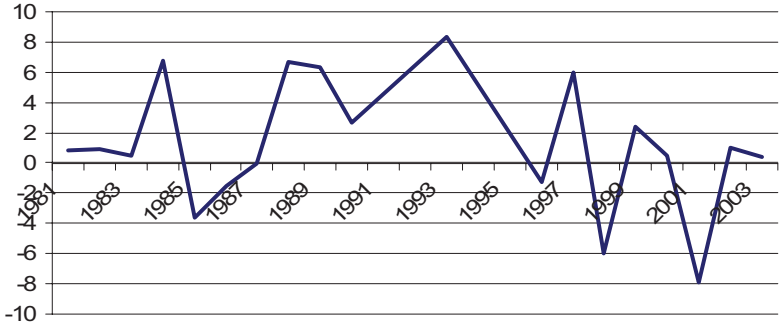


Figure 4.5b. Growth in Labour Productivity, Malaysia

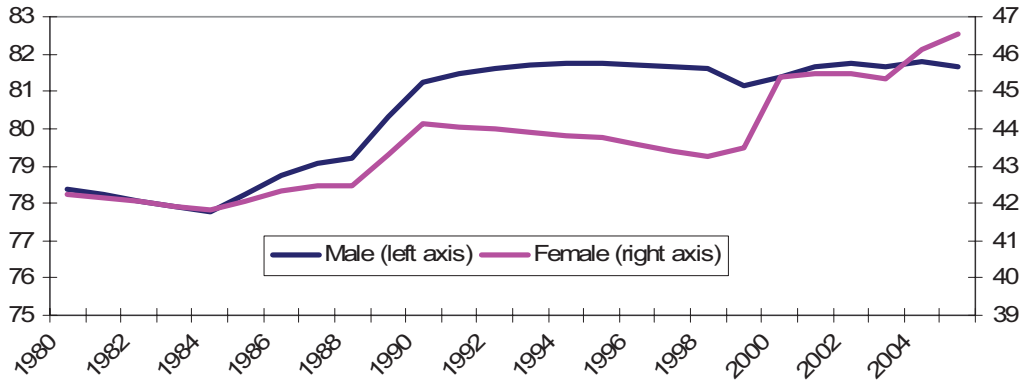


extending E_t

In the midst of its industrial boom in the early 1990s, Malaysia undertook several policy initiatives to better equip its workers for the needs of its booming economy (Kanapathy 2000). In 1990, it launched its Action Plan for Industrial Technology and Development, which put emphasis on human resource development to continuously improve the quality of labour in the country. In 1993, it established the Human Resource Development fund to mandate the training of workers. The government also provided fiscal and financial incentives for the education and training of workers, as well as liberalized the education and training industry (Kanapathy 2000).

It is probably indicative of the partial success of these policies that unemployment rate in Malaysia in this period continuously declined whereas labour force participation rate, at least for males, was either increasing or stable despite its rapidly changing economy (Appendix Figure 1 and Figure 4.5c), the trend in unemployment and participation halted only by the onset of the Asian financial crisis. Female labour force participation rate declined continuously from the start of the 1990s up to the crisis and then rose rapidly after.

Figure 4.5c. Labour Force Participation Rate, Malaysia



employing U_t and NL_t

Malaysia has also attempted to entice the unemployed and those not part of the labour force to join the ranks of the employed by pushing for flexible work arrangements (especially for women), programs for the re-employment of qualified retirees, and provision of transportation to increase labour mobility towards areas of high labour demand – all as part of its Seventh Malaysia Plan 1996-2000 (Ruppert 1999). Like Singapore and Hong Kong, Malaysia also admits a large number of domestic workers – 318,029 as of 2006 according to its Ministry of Labour – which could have the effect of raising the participation rate of women.

While participation rate of women has gone up quite rapidly in recent years as maybe seen in Figure 4.5c, the gains come almost entirely from those in the prime working age of 20-49, as could be seen from Figure 4.5d. The participation rate for women aged 50 years and up is even lower in the most recent period than it was in the early 1990s. In the case of men, the participation rate of those 60 and up and even those from 30-39 has been declining in recent years, while those from 20-29 and 40-49 have been increasing (Figure 4.5e). The participation rate of those from 15-19 have been declining for both sexes probably due to increased educational opportunities brought on by an increase,ngly wealthy economy. In sum, there appears to have been some success in raising the participation rate of women in the aggregate but no visible success in the raising the participation of those in retirement and near retirement age for both men and women.

Figure 4.5d. Labour Force Participation Rate by Age Group, Female

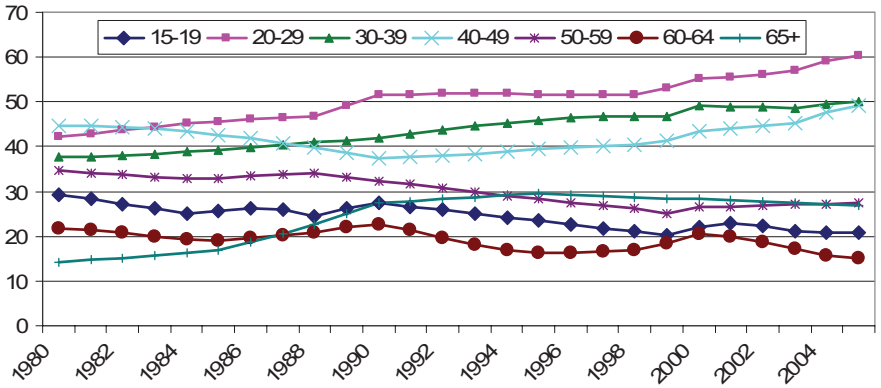
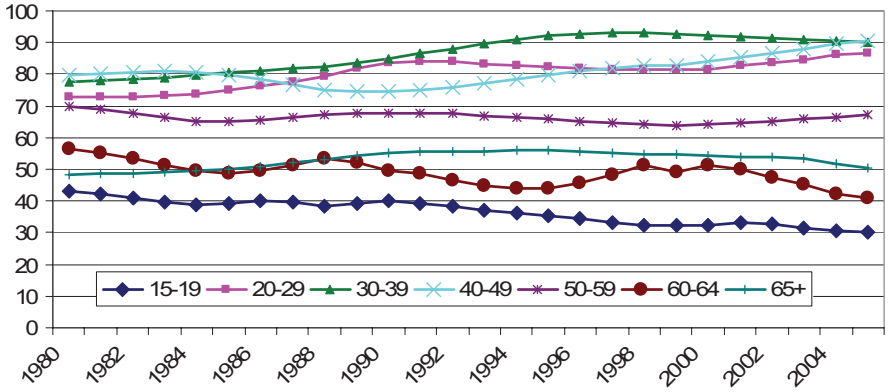


Figure 4.5e. Labour Force Participation Rate by Age Group, Male



increasing E^F

Migration is the main means by which Malaysia has dealt with its labour shortage. Malaysia is second only to Singapore in terms of the share of foreign workers in its labour force, estimated at 22% as of 2003 (Kanapathy 2005). More than 98% of the foreign workers in Malaysia are classified as low or semi-skilled.[37] Foreign workers were first imported as a result of shortages in the construction and plantation sectors but recruitment was later extended to the agriculture, manufacturing, and services sectors (Ministry of Labour 2006). As of 2006, the Ministry of Labour reports a total of 1.85 million documented migrant workers of which 603,032 were in manufacturing, 409,878 in plantation, 282,340 in construction, 318,029 in domestic work, and 282,349 in other services. About two-thirds of these documented workers come from Indonesia but a substantial number also come from Nepal, India, Vietnam, Bangladesh, Myanmar, and the Philippines. Apart from the documented workers, it is estimated that undocumented workers in the country number about 700,000, again mostly from Indonesia (Kanapathy 2006).

[37] Contrast this, for example, with Japan where 12% of temporary migrant workers are classified as highly-skilled (Iguchi 2006).

Like Singapore, Malaysia uses the work permit system to manage migration flows into the country. Work permits are contingent on several conditions such as age, sex, nationality, skills, duration and sector of occupation (Kanapathy 2006). There are 3 permit types: i) visit pass for temporary employment; ii) visit pass for professional employment; and iii) employment pass.

The first type is for unskilled and semi-skilled workers between the ages of 18 and 45 or skilled workers earning less than RM2,500 a month and has a duration of up to one year. The employer is required to pay a security deposit and the permit holder is not allowed to bring in dependents. The second type is for professionals and also has a duration of up to one year. As in the first type, dependents are not allowed and a security bond needs to be paid. The third type is for skilled workers with employment contracts of at least 2 years and whose compensation exceeds RM2,500. This type of permit is renewable for up to five years and permit holders are permitted to bring in dependents. As in Singapore, a levy is imposed on the employment of foreign workers but a notable difference is that, in contrast to Singapore, in Malaysia a higher levy is imposed on higher-skilled workers.[38]

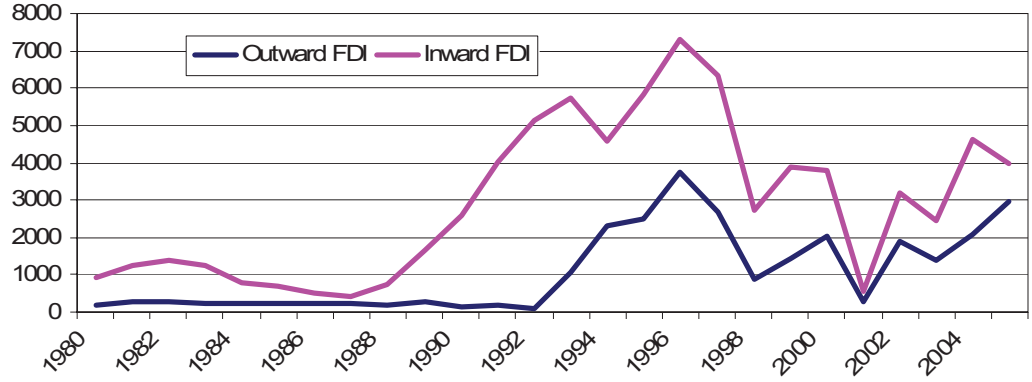
Kanapathy (2005) argues that Malaysia's migrant admission policies have been quite successful - evolving with the changing circumstances and developing a fairly comprehensive policy framework and efficient administrative infrastructure. Indeed it is difficult to imagine Malaysia attaining the rapid growth it has had since the late 1980s if not for its migrant admission policies. On the other hand, there are still kinks to be ironed out in the policies and their implementation as evidenced by the still huge number of undocumented migrants in the country and the inability to convict employers hiring undocumented workers (Kanapathy 2005).

outsourcing and relocating

Unlike the four other economies considered here, Malaysia has yet to undertake large-scale offshoring as means to ease its labour shortage problems. In fact, inward foreign direct investment is still far larger in the country than outward foreign direct investment as maybe seen from Figure 4.5f.

[38] According to Kanapathy (2006) this is due to the current greater need of the economy for lower-skilled workers.

Figure 4.5f. Foreign Direct Investment Flow, Malaysia



others

Another measure Malaysia has undertaken to try and ease labour shortage, particularly in skilled workers, is to try and woo back Malaysians based overseas. The government first tried this in 1995 upon the introduction of the Brain-Gain scheme but this was unsuccessful, attracting only 23 Malaysian returning scientists and experts, of an estimated 30,000 working overseas, until it was discontinued upon the outbreak of the Asian crisis (Kanapathy 2005). In 2001, the Scheme was re-introduced to cover a wider range of skills and incentives were increased to include income tax exemption, import duty and sales tax exemption for two cars, personal belongings tax exemption, car import license and permanent resident status for spouse and children of the returning Malaysian to be granted within six months of arrival in Malaysia but still with limited success (Kanapathy 2005).

5. Conclusion

This paper looked at the extent of and the responses to the problem of labour shortage in the five economies of Japan, Korea, Singapore, Hong Kong, and Malaysia. For Japan, Korea, Singapore, and Hong Kong, the labour shortage problem has both economic and demographic roots. For Malaysia, the labour shortage is caused primarily by the robust economy. The labour shortage, if left unaddressed, is of great concern for these economies, especially Japan and Korea, which rely on pay-as-you-go social security systems. The manpower shortage is not just in the aggregate, however, but also for specific high-skill jobs, and to a greater degree now, except perhaps in Hong Kong, for low-skilled undesired jobs the relatively well-off local populace of these countries are unwilling to undertake. The latter is of particular problem for Japan and Korea where cultural homogeneity is valued highly.

Japan, Korea, Singapore, and Hong Kong have undertaken massive domestic capital and offshore direct investments that have increased productivity and certainly reduced labour demand pressure in their own economies. In Japan and Singapore, there is some evidence that policies to raise the participation of women, such as the removal of discriminatory laws, the provision of public insurance for long-term care, have been effective. No policy appears to have been effective in raising the participation rate of the old-age workers (65+), however.

The trainee systems undertaken in Japan and Korea, effectively as a backdoor for low-skilled workers, are widely considered as failures, however, as they have resulted in the proliferation of undocumented migrant workers with the attendant problems of rights violation and even trafficking. In Korea early indications are that the Employment Permit System it has instituted since 2004 is effective in addressing labour shortage in low-skilled workers, while mostly avoiding the proliferation of illegal workers. In Malaysia, the response to labour shortage, mainly in low- and semi-skilled workers, has largely taken the form of admitting foreign migrant workers. The policy has allowed the Malaysian economy to grow at a rapid pace in the last two decades but the country is saddled with a large number of undocumented workers. Monetary incentives to try and reverse low and declining fertility rates in Japan, Singapore, and Hong Kong have not yet yielded any positive results.

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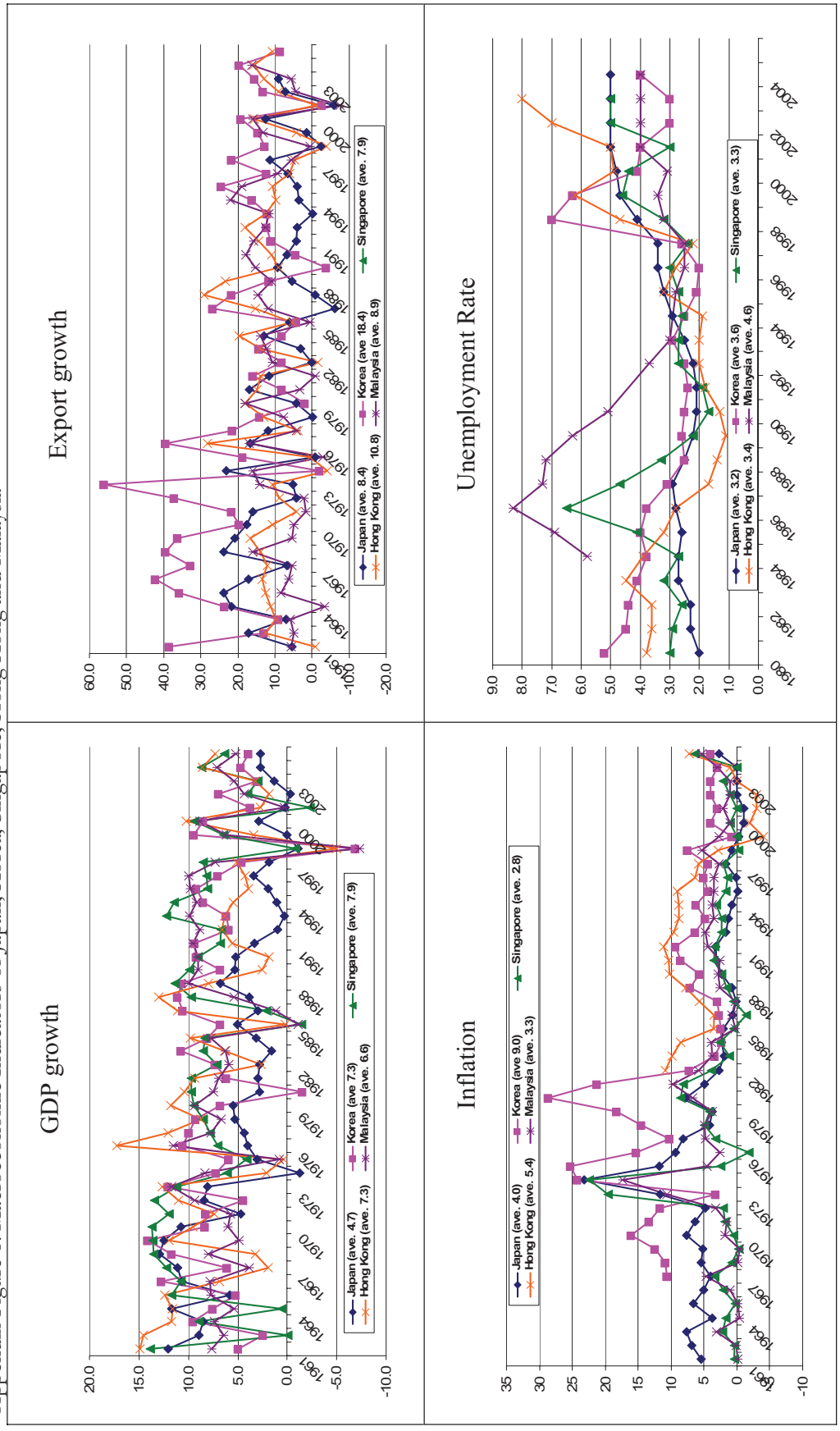
Appendix Figure 1: Macroeconomic Indicators of Japan, Korea, Singapore, Hong Kong and Malaysia



This paper looks at the extent of and policy responses to the problem of labour shortage in the economies of Japan, Korea, Singapore, Hong Kong, and Malaysia. The labour shortage has both economic and demographic roots in these economies, except in Malaysia where it is mainly of economic origin. Policy responses are categorized into raising productivity, extending employment, enlisting the inactive and unemployed, importing workers, offshoring and outsourcing, and improving fertility. The five countries undertook different mixes of policy responses to labour shortage with varying degrees of effectiveness.

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