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# How Japan and the newly industrialized economies of Asia are responding to labor scarcity

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*In Japan and the newly industrialized economies (NIEs) of Asia—Hong Kong, Singapore, South Korea, and Taiwan—labor is scarce and labor costs are rising. Labor force growth is expected to slow dramatically over the next 15 years and labor scarcity to become even more severe. Rapid aging of the work force will also exert upward pressure on labor costs.*

*Producers in these countries have already become less competitive in labor-intensive industries. Firms have reacted by moving out of labor-intensive manufacturing, moving into higher value-added industries, increasing automation and the capital-intensity of production, and transferring some manufacturing operations overseas. This restructuring, which is creating new demand for skilled labor, has prodded governments to invest more in education. To alleviate labor scarcity, Japan and the NIEs are also importing workers from abroad, encouraging greater labor force participation by women, and prolonging the participation of older workers in the labor force.*

*Economic growth in the NIEs has been due primarily to factor accumulation—increases in labor supply and, more important, increases in capital stock—rather than to increases in total factor productivity, or technological progress. Some believe that these economies will not be able to rely as heavily on capital accumulation for future growth. Slower labor force growth, which may cause the returns to capital to fall more rapidly, should add to this concern. Governments in the region appear to be responding by adopting policies that should encourage technological progress. They are spending heavily on education, training, and research and development.*

**T**he diversity of Asia's demographic trends has contributed to the diversity of the region's labor-market conditions. Because of recent rapid population growth, which has been due to high fertility and declining mortality, labor is abundant and relatively cheap throughout much of the

*To industrialize, the NIEs relied on cheap labor from three sources—large cohorts of youth entering the labor market, large surpluses of rural workers, and growing numbers of young working women. These labor pools have been largely tapped.*

region. In Southeast Asia, labor force growth rates suggest that labor will continue to be abundant and cheap in Indonesia, the Philippines, and Vietnam for the foreseeable future. In China, large labor surpluses imply that labor will remain abundant despite the expected slower growth of the labor force in the future. In South Asia, very rapid labor force growth is projected to persist, and increasingly large cohorts of youth will enter the labor market each year. Elsewhere (Bauer 1990, 615) I have concluded that the economic prospects in that subregion are grim:

The challenge of generating sufficient productive employment will increase with little demographic relief in sight. Despite rural-to-urban migration, rural labor forces will continue to grow. The tendency will be for the already high densities in Asian agriculture to increase rather than decline, thereby limiting productivity growth of farm labor and impeding progress toward reducing the incidence of rural poverty, inequality, and environmental degradation. Evidence is mounting, moreover, that the potential for further growth in agricultural employment is limited in many countries. . . . In the cities, unprecedented urban population growth will exacerbate employment problems, placing a greater burden on urban informal sectors.

In Japan and the Asian newly industrialized economies (NIEs) of Hong Kong, Taiwan, South Korea, and Singapore, on the other hand, labor is scarce and labor costs are rising. These rising labor costs have eroded the competitiveness of Japan and, more recently, the NIEs in labor-intensive manufacturing. Recruiting and retaining workers is becoming increasingly difficult. In Singapore, for example, rising wages and high labor turnover, both symptoms of a tight labor market, are major concerns of employers.

Labor scarcity in the NIEs should become even more severe as labor force

growth rates decline still further over the next 15 years (Table 1). Because of rapid fertility declines in the recent past, Singapore is projected to have only 44 percent, Taiwan only 65 percent, and South Korea only 82 percent as many workers entering the labor market during the 1990s as they had during the 1980s (Bauer 1990, 619).

**Table 1.** Labor force growth rates (actual and projected, in percentages): Japan and the Asian NIEs, 1980–2010

Country	1980–90	1990–2000	2000–10
Japan	0.92	0.36	-0.35
Singapore	1.63	0.62	0.3
South Korea	2.84	1.81	1.08
Taiwan	3.49	1.66	0.71

Source: Bauer (1990, table 1).

The rapid industrialization of the NIEs relied heavily on cheap labor from three sources—the previously large cohorts of youth entering the labor market, large surpluses of rural workers, and increasing numbers of young working women. These labor pools have been largely tapped. Today, smaller and smaller cohorts are entering the work force. Agricultural labor surpluses have disappeared. More women may enter the labor force, but their participation will only slow, not reverse, the trend.

These economies will also have to cope with rapid aging of their work forces (Table 2), and labor force aging may make it more difficult to restructure their economies. Clark and

**Table 2.** Median ages of the labor force (actual and projected): Japan and the Asian NIEs, 1980, 2000, 2010

Country	1980	2000	2010
Japan	39.6	43.1	43.2
Singapore	29.0	36.9	38.8
South Korea	33.2	37.3	39.9
Taiwan	32.6	36.7	39.4

Source: Bauer (1990, table 3).



Spengler (1980), for example, argue that an aging work force can constrain the ability of economies to adjust to structural and technological change. Younger workers tend to be more mobile than older workers. Moreover, the rate of investment in job skills is lower for older workers, and they may find it more difficult to respond to changing production techniques (Clark 1988). Given the existence of seniority-based wage systems, aging may also push labor costs upward.

Firms and governments in Japan and the NIEs have had to respond vigorously to population aging and labor scarcity. The labor-scarce Asian economies have reacted to their declining competitiveness in labor-intensive production mainly by shifting into higher value-added industries, by relying more on automation and the capital-intensity of production, and by transferring some manufacturing overseas through foreign direct investment.<sup>1</sup> This rapid industrial restructuring, which is changing the relative demand for various types of labor, has prodded governments to invest more in education. Besides restructuring and foreign direct investment, these economies have attempted to address the problem of labor scarcity by importing labor from abroad, by encouraging more women to participate in the labor force, and by prolonging the participation of older workers.

A deepening concern of the NIEs is the impact of increased labor scarcity on their economic growth. Recent theoretical work has renewed academic interest in economic growth, and an expanding body of empirical literature suggests that increased labor scarcity will constrain growth in the NIEs. Past growth has been due primarily to capital accumulation. Increases in total factor productivity apparently have not made substantial contributions to economic growth.<sup>2</sup> If slower labor force growth causes the decline in the returns

to capital to accelerate, the NIEs will not be able to rely as heavily on capital accumulation for economic growth as they have in the past. This will underscore the importance of adopting policies to promote technical innovation.

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## THE IMPACT OF POPULATION AGING ON LABOR COSTS

Reduced labor force growth, which will exacerbate labor scarcity in Japan and the NIEs, should cause labor costs to rise. Aging of the work force may have the same effect. Seniority-based wage systems imply that earnings rise substantially as workers age, and average wage levels should increase as the proportion of workers in the higher-earning age groups rises. In addition, pension schemes place a heavier burden on employers as the relative size of the retired population grows.

### SENIORITY WAGES AND RISING LABOR COSTS

Unit labor costs, or the average costs of labor per unit of output—a standard gauge of economic competitiveness—are determined by the level of wages relative to labor productivity. If wages

*Seniority-based compensation schemes imply that average wages will rise as the work force ages. But if older workers receive higher wages because they are more productive, then unit labor costs need not rise.*

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1. Direct investment is the act of purchasing an asset and at the same time acquiring control of it. The acquisition of a firm in another country is an example of foreign direct investment.

2. Varying proportions of economic growth rates across countries cannot be explained by increases in labor forces and capital stocks. These "residual" components of growth are attributed to growth in total factor productivity. Technological change, for example, often increases total factor productivity growth and contributes to economic growth.

rise more than productivity, then unit labor costs increase and competitiveness may decline. An increase in wages, however, can be offset by increases in labor productivity, leaving unit labor costs unchanged.

Population aging should affect both wages and productivity. Seniority-based compensation schemes imply that average wages will rise as the work force ages. The critical question is, to what extent does productivity also rise with workers' experience? If older workers receive higher wages because they are more productive, then aging need not result in higher unit labor costs.

The impact of aging on unit labor costs depends upon three factors. First is the effect of age and experience on labor productivity. Second is the shape of the age-earnings profile, which depends upon the returns to tenure in a company, the returns to general labor-market experience, and average levels of tenure within age groups. Third, the pattern of aging can affect the timing and extent of changes in the wage bill.

We can estimate the shape of age-earnings profiles, and we can observe and project patterns of aging. It is not

that difficult, therefore, to examine the relationship between aging and average levels of wages. There appears to be little evidence about the relationship between age and productivity, however, and it is difficult to examine directly the effect of aging on unit labor costs.

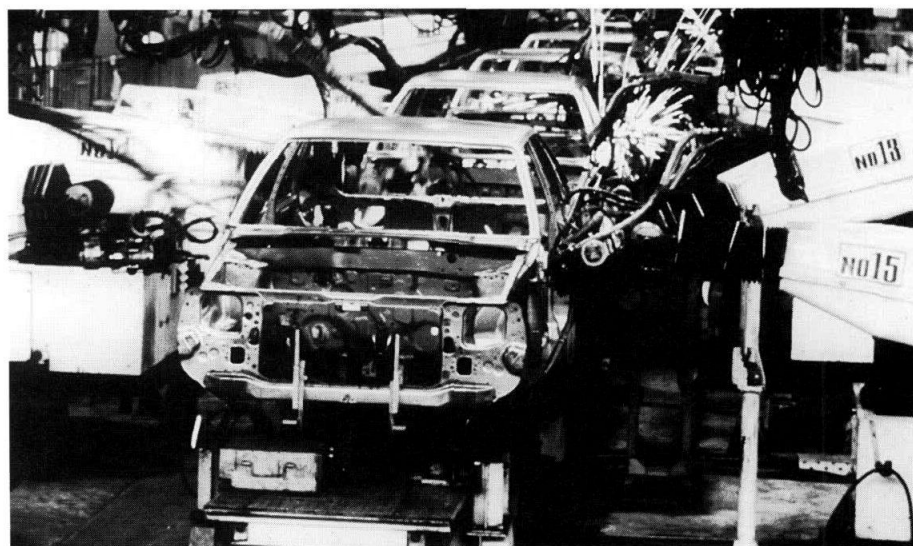
It is generally believed that workers' productivity first increases with age and then declines. This is the pattern predicted by human-capital theory. Productivity increases because of investments in human capital made after workers complete their schooling. Eventually productivity declines as the rate of investment in human capital declines with age, skills depreciate, and physical prowess declines. The age at which productivity peaks and the extent to which it declines thereafter is thought to vary by occupation.

Although not much evidence exists about the relationship between age and productivity, there are reasons to believe that seniority-based increases in earnings exceed increases in productivity. In other words, I suspect that labor force aging does cause unit labor costs to rise. This inference is based in part on economic theories of earnings determination.

Two competing theories explain the relationship between age and earnings. Human-capital theory argues that earnings rise because productivity increases with experience and specific training (Becker 1962). Aging of the work force in this case need not increase unit labor costs, since the higher wages of older workers are offset by their higher productivity. Human-capital theory alone, however, may not provide an adequate explanation of why earnings rise with age. One problem is that it does not explain the adoption of mandatory retirement practices. If older workers are paid according to their productivity, then why should they be forced to retire? Agency theory provides the other major explanation of the earnings profile. Firms and workers may enter into implicit contracts under which wages increase with age even if productivity does not. Lazear (1979) argues that seniority-based pay schemes have been established to minimize labor turnover and shirking. Workers are paid less than the value of what they produce early in their careers and then are paid more than what they produce later. The overpayment of older workers provides a strong incentive for employees to put forth the expected work effort and to remain with the firm. If workers shirk, the firm will presumably become aware of it and dismiss them, depriving them of the overpayment they would receive at older ages.

Agency theory does provide an explanation of mandatory retirement practices. If older workers are paid more than their productivity, firms have to limit the number of years such workers are employed. This theory implies that aging will cause unit labor costs to rise.

Japan and Singapore provide support for the agency theory's explanation of earnings profiles. In these countries, and probably in the other NIEs as well, labor force aging appears to be driving up labor costs.



*Automating manufacturing is just one of the ways that Asia's newly industrialized economies are coping with labor shortages. Other strategies are investing in education, encouraging more women to join the labor force, and keeping older workers at work longer.*

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## Japan

Scholars of Japan's labor market have used both human-capital theory and agency theory to explain the strong effects of tenure on earnings. Mincer and Higuchi (1988), for example, argue that rapid economic growth and technological change in Japan generated a need for intensive investment in human-capital formation and that specific training has generated the steep age-earnings profiles.

One argument in favor of the agency theory as an explanation for Japan's compensation system is the widespread adoption of mandatory-retirement policies. Moreover, the Lazear contracting model predicts that an increase in the age at mandatory retirement will result in a flattening of the tenure-earnings profile. A move toward later retirement should reduce the extent to which earnings rise with years of tenure in a firm. The human-capital model predicts the opposite. Clark and Ogawa (1992a) have found that higher ages at mandatory retirement have been associated with flatter earnings profiles, supporting Lazear's model. Moreover, Japanese firms have apparently reacted to aging and rising levels of tenure among their work forces by making changes in seniority-based pay systems (Bauer and Ogawa 1994). This suggests that aging has put upward pressure on labor costs.

Given data constraints, I cannot quantify the impact of aging on unit labor costs in Japan. It is not difficult, however, to gauge roughly the impact of aging on wage bills, ignoring the potentially offsetting effects of aging on productivity (Bauer and Ogawa 1994). Ogawa and I focused exclusively on the impact of aging on the average wages of men. Because earnings profiles are substantially flatter among women, the effect of aging on female wages should be smaller.

The Japanese labor market has been distinguished by its strong seniority system (Hashimoto and Raisian 1991;

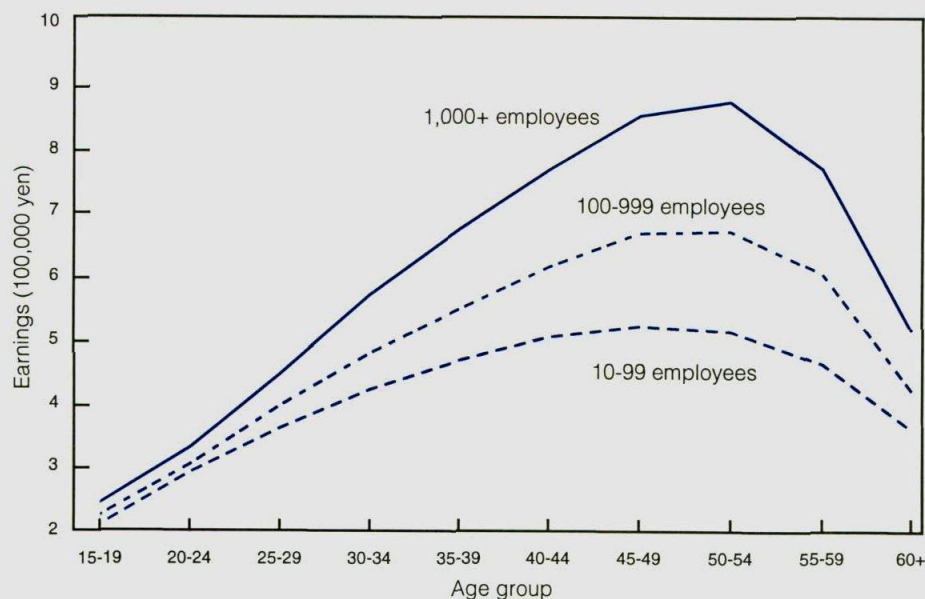


Figure 1. Male age-earnings profiles, by firm size: Japan, 1991

Source: Bauer and Ogawa (1994, figure 1).

Note: Earnings include monthly contractual earnings and annual bonuses.

Mincer and Higuchi 1988; Clark and Ogawa 1992b). High returns to tenure and low labor turnover have resulted in steep age-earnings profiles among male workers, especially in large firms (Figure 1).

Japan's labor force aged substantially between 1976 and 1991: the median age of male workers increased from 38.1 to

42.4 years. The proportion of male workers in their peak earning years (ages 40–54) rose from 27 percent to 35 percent. Changes in age composition were dominated by the aging of the postwar baby-boom generation (Figure 2).

Given the shape of the age-earnings profiles for males, Ogawa and I estimated

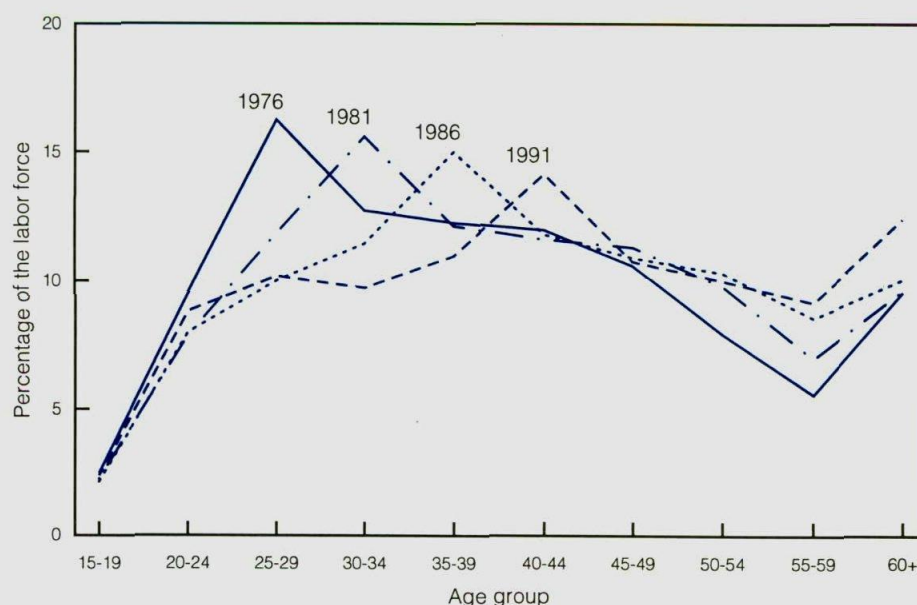


Figure 2. Changing age composition of the male labor force: Japan, 1976–91

Source: Bauer and Ogawa (1994, figure 3).

*In Japan most of the impact of aging has already been felt, since the baby-boom cohorts are now in their peak earning years. As these cohorts continue to age, they will begin to move down the declining portion of the earnings profiles.*

the impact that aging of the male work force had on wage bills over the period from 1976 to 1991. This impact was substantial, especially for large firms. We estimated that observed changes in age composition of the male work force in large firms generated a 9 percent increase in average real wages over the 15-year period. This result suggests that about 30 percent of the overall increase in real wages in large firms over the period could have been due to aging alone. The estimated increases in average wages caused by aging were more modest in small and medium-size firms, at 5–6 percent.

Available evidence indicates that firms made changes in the seniority-wage system during the 1980s, responding to pressures imposed by aging. Clark and Ogawa (1992b) report that the wage increases based on length of employment declined during the decade. Hashimoto and Raisian (1992) note that this decline has been confined mainly to larger firms, where the seniority system is stronger. Ogawa and Clark (1993) summarize government surveys that find that the importance of seniority-based pay has been reduced in large companies. Many firms no longer allow wages to rise after a certain age, and some actually reduce the wages of employees who are over age 55 or 57.

The strong seniority system in Japan has helped to keep labor turnover low, especially in large firms. A recent report by Japan's Research Forum on Socioeconomic Policy suggests that aging of the labor force will make it difficult to maintain the seniority-wage system. The decline in the proportion of young workers in the labor force is causing their wages to rise, bringing their pay more into line with their actual productivity. This deemphasis on seniority as the basis for paying higher wages is in turn reducing younger workers' incentives to stay with firms. Indeed, the re-

port suggests that job turnover among workers may increase in the future.

Although turnover may become more common, I do not expect it to rise dramatically. Using microlevel data from 1990, Ogawa and I have estimated earnings equations for Japanese men (Bauer and Ogawa 1994). Our estimates suggest that the financial costs to workers of changing jobs are so great, at least in the case of large firms, that there appears to be room to revise the seniority system and still retain strong incentives for workers to remain with their employers.

Will aging continue to exert upward pressure on wages in Japan? We examined this question and were surprised by the answer. Given the current shape of age-earnings profiles, the projected change in the age composition of the labor force from 1996 to 2006 should not, by itself, push average wages higher. Most of the impact of aging has already been felt, since the baby-boom cohorts are now in their peak earning years. As these cohorts continue to age, they will begin to move down the declining portion of the earnings profile. The impact of aging on wage bills, therefore, is a short-lived problem.

### **Singapore**

Aging in Singapore, though less advanced than in Japan, is a growing concern (Bauer 1995). Employers fear that aging will raise labor costs and reduce their firms' competitiveness. Historically, the wage structure has been based on seniority, with long salary scales and predetermined wage increases. The scales have resulted in substantial wage differentials by age, and it is believed that salaries at the top of the scales exceed the "value" of the job (Singapore, Ministry of Labour, 1992). Compensation schemes came under pressure during the 1985–86 recession. Many companies became less competitive and in order to reduce labor costs resorted to



retrenching workers. The hardest hit, according to the Ministry of Labour, were the older workers whose higher wages undermined cost competitiveness. Employers were reluctant to increase the mandatory age at retirement. This reluctance provides additional evidence that wages may exceed productivity among older workers.

After the recession of 1985–86, the National Wage Council established a subcommittee on wage reform, which recommended that firms adopt a flexible wage system. One of the aims of the system is to reduce the importance of seniority in determining wages. According to the Ministry of Labour, the move to a flexible wage system was fairly strong. One cost of weakening the seniority system, however, is that it may exacerbate labor turnover, which is already a serious problem in Singapore's labor market. Thus employers face a potential dilemma. On the one hand, aging and concerns over competitiveness call for a flexible wage system. On the other, a strong seniority system reduces turnover and promotes firm-specific training. Such training should become increasingly important as

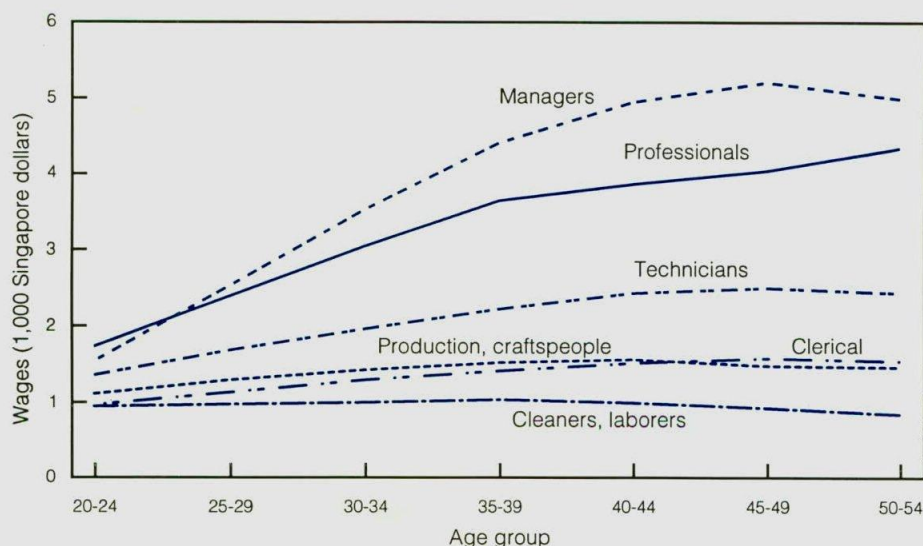
Singapore continues to move into technologically sophisticated, higher value-added production.

Aging may also have an adverse effect on the distribution of income. The slope of the age-earnings profiles, and therefore the impact of aging on average wage levels, varies among occupations. Consider 1992 wage profiles (Figure 3). Wages rise substantially with age for managers and professionals, and they rise moderately with seniority for technicians. For the majority of workers, however, the earnings profiles are flat. Notice that the earnings gap among occupations increases with age. Thus income inequality is likely to increase as a higher proportion of the work force moves into the older age groups. This assumes, of course, that the ratio of managers to workers remains the same.

#### PENSION SCHEMES AND AGING

Employers in Japan and the NIEs are growing increasingly concerned over the impact of aging on pension costs, given the projected rising proportions of elderly persons in these populations

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**Figure 3.** Monthly gross wages (male and female), by occupation: Singapore, 1992

Source: Bauer (1995, figure 3).

Note: Profiles for service and sales workers and operators are similar to the profile for clerical workers.



*Firms' rapid movement into higher value-added manufacturing may cause income inequality to grow by raising the demand for highly educated workers. Older workers, with lower education, will be at a distinct disadvantage.*

(Table 3). Clark (1990) concludes that aging in Japan will cause pension costs to rise dramatically and strain the government's social insurance programs. The number of retirees will grow rapidly after Japan's baby-boom cohort begins to retire from the labor market after 2007 (Bauer and Ogawa 1994). In an effort to reduce the burden on the public pension system, the former ruling coalition parties agreed in December 1993 to raise the age at which workers could begin receiving their full welfare pensions from 60 to 65. The new system will go into effect after 2001.

In the face of rapid population aging, the viability of old-age support systems depends upon their design. The system in Singapore is very different from that in Japan. Most Singaporean workers are covered by the Central Provident Fund, which is essentially a forced savings scheme rather than a defined-benefit pension scheme. Employees and employers contribute fixed percentages of the workers' salaries to the fund.

### MEASURES AIMED AT REDUCING LABOR DEMAND

Labor scarcity and rising labor costs stem from the interaction of labor supply and demand. Strategies for coping with rising labor costs have been aimed at both sides of this interaction. Japan and, more recently, the NIEs have re-

acted to labor scarcity by restructuring their economies, raising levels of capital intensity and automation, and transferring labor-intensive production overseas through foreign direct investment. The dramatic declines in projected labor force growth suggest that these efforts will have to continue.

In the NIEs, higher labor costs have eroded competitiveness in the more labor-intensive industries, such as textiles and apparel. As a result, substantial industrial restructuring has taken place. Within the manufacturing sectors of Singapore, Taiwan, South Korea, and Hong Kong, employment has shifted from labor-intensive industries into higher value-added sectors requiring more intensive skills. In some of the NIEs there has also been a shift in employment from manufacturing into finance and business services (Bauer 1992).

To varying degrees the governments of these countries have been encouraging the shift into higher value-added manufacturing. The governments of Taiwan and South Korea have greatly increased spending on research and development and have subsidized entrepreneurs in high-tech fields. Singapore's government has encouraged industrial upgrading by promoting research and development, investment in high-tech manufacturing, and the growth of the financial and business service sectors. For example, it has given substantial tax concessions to "pioneer industries" and "new technology companies." The government has also increased enrollments at the

**Table 3.** Percentages of the population aged 65 and older (actual and projected): Japan and the Asian NIEs, selected years, 1990–2030

Country	1990	2000	2010	2020	2030
Japan	11.54	15.36	18.68	21.91	26.13
Singapore	5.57	7.31	9.64	15.30	21.38
South Korea	4.97	6.90	9.64	13.04	18.80
Taiwan	6.03	8.14	9.12	12.69	17.52

Source: Bos et al. (1991, table 12).



national universities and polytechnic institutes to meet the growing demand for skilled labor that has resulted from the restructuring drive (Bauer 1995).

The rapidity of this restructuring may have adverse effects. One potential problem is that income inequality may grow. In the United States during the 1980s, shifts in the relative demand for labor among various skill and education groups substantially widened earnings gaps. This is likely to occur in the NIEs over the next 10 years. Growth in high-tech manufacturing and business services will raise the relative demand for highly educated workers. Given the time lag in increasing the supply of graduates, earnings differentials by schooling levels should widen. Older workers, who generally have much lower educational attainments than younger workers, will be at a distinct disadvantage. The general shortage of labor, however, will limit the extent to which inequality rises. Labor scarcity has been driving up the wages of unskilled as well as skilled workers.

The transfer of labor-intensive manufacturing to labor-abundant countries through foreign direct investment has accompanied the domestic restructuring in the NIEs. Firms based in Singapore, Taiwan, South Korea, and Hong Kong have invested heavily in Indonesia, Malaysia, Thailand, China, and, more recently, Vietnam. The NIEs, long a destination of foreign direct investment from the older industrial economies, have become an important source of investment funds. Some of the factors generating the surge in foreign direct investment could be considered short-term: exchange-rate movements, the need to recycle current-account surpluses, and the liberalization of economic policies in receiving countries. However, the flow of foreign direct investments can also be viewed as a response to changes in comparative advantage, and the diverse labor-supply

trends in the region should continue to promote capital flows over the long run.

## MEASURES AIMED AT INCREASING LABOR SUPPLY

Japan and the Asian NIEs have also responded to labor scarcity by attempting to increase their labor supply. They have used three approaches—importing workers from abroad, encouraging more women to join the labor force, and postponing retirement.

### IMPORTING LABOR

Employers in Japan, Hong Kong, Singapore, and Taiwan have been hiring growing numbers of workers from abroad and putting pressure on their governments to liberalize policies that restrict the number of foreign workers. Immigration is a divisive political issue, however, and the governments have continued to restrict the importation of labor.

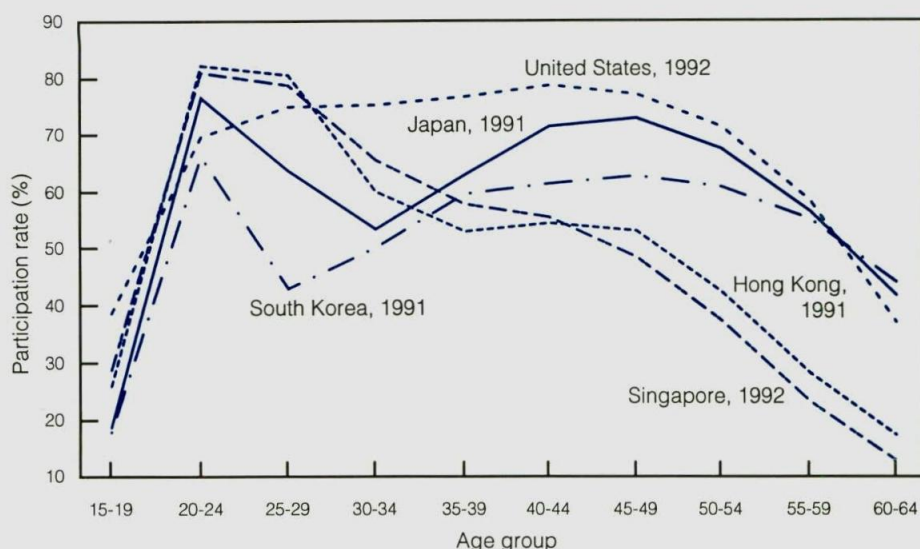
Singapore, for example, has made extensive use of foreign labor; but many Singaporeans believe that labor importation causes political and social problems, depresses the wages of low-income domestic workers, and limits restructuring efforts. Responding to these concerns, the government began imposing a levy on employers of foreign workers in April 1987. This made foreign labor more expensive and encouraged employers to use more capital- and skill-intensive production methods (Lim et al. 1988).

### ENCOURAGING FEMALE LABOR FORCE PARTICIPATION

Women were an important source of labor in the NIEs during the countries' labor-intensive industrialization. They

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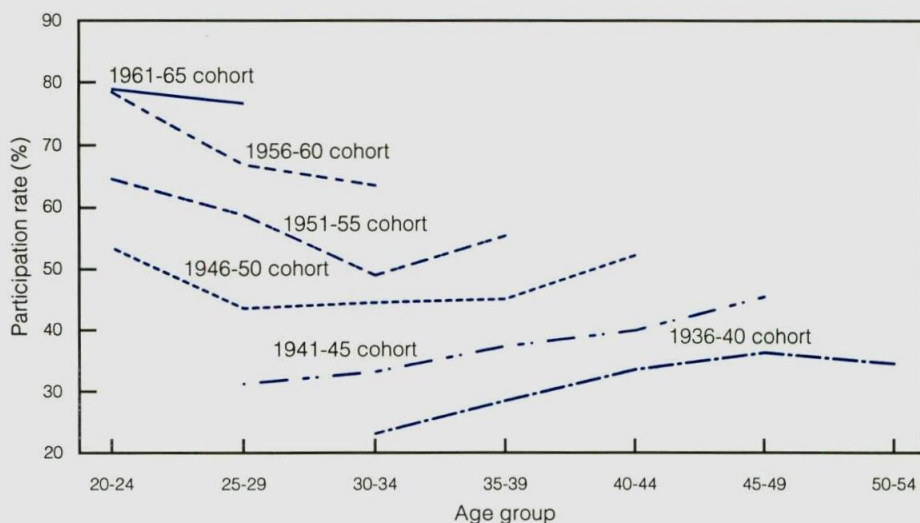
**Figure 4.** Female labor force participation rates, by age group: selected countries, recent years

Sources: International Labour Organization, *Yearbook of labour statistics* 1992 (1992, table 1); Singapore, Department of Statistics, *Yearbook of statistics: Singapore* (1992, table 3.2).

continued to enter the labor force in growing numbers during the 1980s. Participation rates among women in Japan, Hong Kong, and Singapore ranged from 35 to 38 percent in 1983 and rose to around 50 percent by 1992. This trend will continue as labor scarcity and higher wage levels draw increasing numbers of women into the market. Continued low fertility and rising levels of female education will support the trend.

Although labor force participation rates are high among young women in Japan and the NIEs, rates among older women are comparatively low (Figure 4). I suspect that this pattern will change as the current cohorts of young women, who have stronger attachments to their jobs, grow older and continue to work.

Figure 5 illustrates the participation behavior of six cohorts of Singaporean women over the course of their work-



**Figure 5.** Female labor force participation rates, by selected birth cohorts: Singapore

Source: Bauer (1995, figure 5).

ing careers. It suggests that much of the decline in Singapore's female participation with age observed in the cross-sectional diagram (Figure 4) is due to the fact that older cohorts had consistently lower participation rates than younger cohorts. It does not appear to be caused primarily by women exiting the labor market after childbearing.

Increasing the participation among older women could reduce, but not reverse, the expected decline in labor force growth rates. Consider the case of Singapore, where participation rates among older women are especially low. Recently I projected labor force growth between 1990 and 2010, making two alternative assumptions (Bauer 1995). The first scenario assumed that female participation rates would remain at their 1992 levels. The second scenario assumed that by 2010 the rates among women in the 30-54 age bracket would approach the rates currently observed in the United States. Under the second scenario the female labor force would be roughly 25 percent larger in 2010 than under the first scenario, and the total labor force would be 9 percent larger. In other words, the average growth rate of the labor force projected over this period is about 1 percent per year in the second scenario—higher than the 0.5 percent projected in the constant-participation scenario but considerably less than the 3.4 percent annual growth observed during the 1980s.

## POSTPONING RETIREMENT

Older men and women are, to varying degrees, another potential labor pool that may be increasingly tapped in the labor-scarce Asian economies. Participation rates among the elderly in most of these countries are already significant by international standards. Keeping older workers in the labor market can substantially improve the aggregate labor supply.



Participation rates among men and women of ages 55–64 in South Korea and especially Japan are already high relative to rates in the United States (Table 4). Participation rates of older men in Hong Kong are similar to the U.S. rates, but rates among older Hong Kong women are much lower. Participation among Singaporean men and women over age 55 is comparatively low, and therefore it is in Singapore that postponing retirement is likely to have the largest impact on labor supply.

In my 1994 study I projected the size of Singapore's labor force in 2010 under two additional scenarios. In the first I assumed that participation rates among Singaporean men and women would remain at their 1992 levels. In the second I assumed that participation rates would increase by 2010 to the levels observed in Japan in 1992. The projections indicated that Singapore's labor force in 2010 would be roughly 7.4 percent larger if participation among the elderly increased to the Japanese level than if participation rates remained unchanged. In absolute numbers, labor force growth would increase from 14,500 to 20,600 workers per year between 1990 and 2010.

Historically, labor force participation rates among the elderly tend to decline as incomes rise, the importance of agriculture declines, and social security and pension schemes develop. The trend toward early retirement in Japan and some of the NIEs, however, appears to be reversing itself. Labor force participation among older men and women in Japan, Hong Kong, South Korea, and Singapore between 1983 and 1992 was stable or growing, rather than declining.

Among men aged 55–59, participation levels have been fairly stable in Hong Kong but have risen in Japan, South Korea, and Singapore since the mid-1980s. The participation rate among Japanese men in this age group

**Table 4.** Labor force participation rates among the elderly (in percentages), by sex: Japan, the Asian NIEs, and the United States, 1992

Country	Males		Females	
	55–59	60–64	55–59	60–64
Japan	93.6	75.0	55.7	40.7
Hong Kong	80.4	54.6	25.6	16.3
Singapore	71.3	49.2	22.7	12.6
South Korea	84.9	71.0	54.1	44.9
United States	79.8	55.1	57.4	36.6

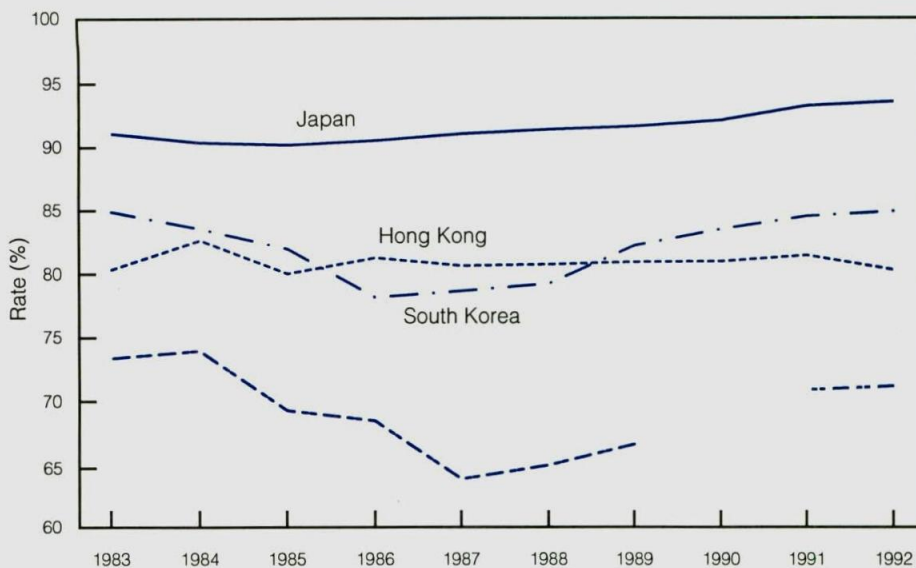
Source: International Labour Organization (1993, table 1).

rose from 90.3 percent in 1985 to 93.6 percent in 1992 (Figure 6). In South Korea, after declining in the early 1980s, the participation rate of men in this age group increased from 78.4 percent in 1986 to 84.9 percent in 1992; and in Singapore, after falling sharply in the early 1980s, participation rose from 63.8 percent in 1987 to 71.3 percent in 1992.

Participation rates among men aged 60–64 (not shown in Figure 6) have risen since 1988 in Japan, South Korea, and Singapore, although they have continued to decline in Hong Kong. Participation levels among women 55–59 have also risen since 1988 in Japan, South Korea, and Singapore, but not in Hong Kong, where rates have declined continuously since 1984 (Figure 7). I believe that the recent trend toward later retirement is a response to growing labor scarcity and increasing life expectancy, and I expect the trend to continue. One reason is that mandatory retirement ages have been rising, at least in Japan and Singapore.

In Japan the growing labor scarcity and rising pension costs have led firms to raise the mandatory retirement age by an average of four years since 1965. In 1974 about one half of the firms with mandatory retirement had a retirement age of 55 or younger. By 1991 roughly 71 percent had retirement ages of 60 or older (Ogawa and Clark 1993, 15).

*Historically, labor force participation rates among the elderly tend to decline as incomes rise. The trend toward early retirement in Japan and some of the NIEs, however, appears to be reversing itself.*

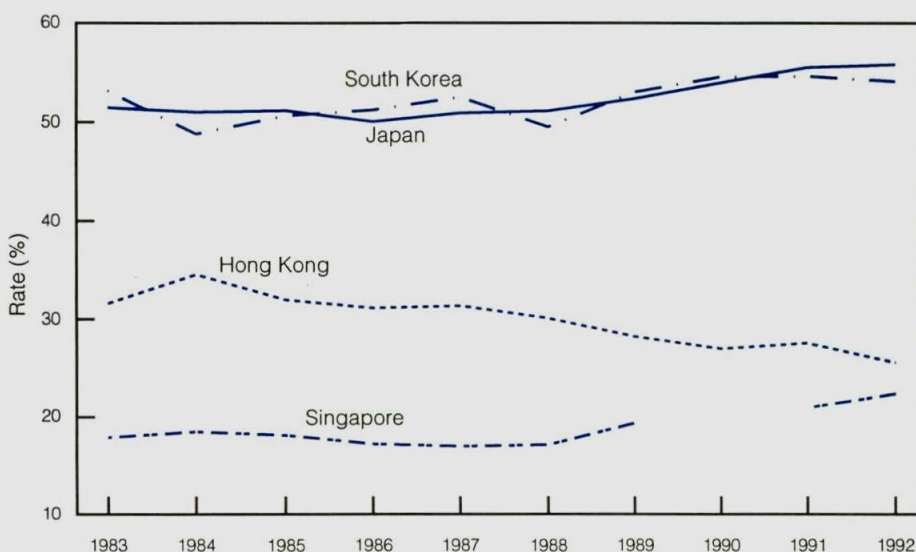


**Figure 6.** Male labor force participation rates, ages 55-59: Japan and three Asian NIEs, recent years

Sources: International Labour Organization, *Yearbook of labour statistics* (various years, table 1); Singapore, Department of Statistics, *Yearbook of statistics: Singapore* (various years, table 3.2).

In December 1993 Japan's Employment Council, a government advisory panel, suggested that companies should retain employees until the age of 65 as a way of coping with population aging. Japanese firms, however, have been reluc-

tant to retain older workers because of their relatively high wages under seniority-based compensation schemes. The government has therefore begun providing subsidies to firms as an encouragement to retain older workers.



**Figure 7.** Female labor force participation rates, ages 55-59: Japan and three Asian NIEs, recent years

Sources: International Labour Organization, *Yearbook of labour statistics* (various years, table 1); Singapore, Department of Statistics, *Yearbook of statistics: Singapore* (various years, table 3.2).

In Singapore, until recently the mandatory retirement age was 55. This age was widely believed to be too low, given increases in life expectancy and growing labor shortages. In 1988 the National Wage Council began exhorting companies to raise the retirement age to 60 or higher. Nevertheless, employers were reluctant to do so, in part because their seniority wage systems made older workers expensive. The government therefore passed the Retirement Age Act of April 1993, which prohibits employers from dismissing workers below age 60 on the basis of age. The mandatory retirement age will be raised to 67 by the year 2003.

As a positive inducement to firms to employ older workers, the Singaporean government also lowered mandatory employer contributions to the Central Provident Fund for employees over age 55. Both employers and employees contribute fixed percentages of the employees' salaries to the fund. As of July 1993, the employers' contribution rate was 18.5 percent of the gross salary of workers below age 55. That rate was reduced to 7.5 percent for workers aged 55-65 and to 5 percent for workers over age 65.

## POTENTIAL EFFECTS OF LABOR SCARCITY ON ECONOMIC GROWTH

Some observers believe that slower labor force growth will make it more difficult for the NIEs to maintain their impressive rates of economic growth. According to recent studies, capital accumulation has been the NIEs' most important source of growth. As a result of extremely high rates of investment, capital stocks and capital per worker have risen dramatically in these economies. Neoclassical growth theory as-



serts that the returns to capital should decrease as capital per worker increases. At any given rate of investment, slower labor force growth should hasten the rise in capital-to-labor ratios and could accelerate the decline in returns to capital. This view suggests that in the future the NIEs will not be able to rely as heavily on capital accumulation to spur growth as they have in the past.

## SOURCES OF GROWTH IN THE NIES

The NIEs have enjoyed dramatic economic growth over the past three decades (Table 5). Since the 1960s, they have experienced average annual growth rates in excess of 7.4 percent—in contrast with the United States, where, for example, postwar growth has averaged only 3.0 percent. Economic growth is driven by three factors: growth in the capital stock, growth in labor supply (both raw numbers and human-capital accumulation through education and training), and growth in total factor productivity (TFP). TFP growth represents the portion of economic growth that cannot be explained by measured increases in labor supply and the capital stock. Technical progress is an important cause of TFP growth.

The NIEs have achieved extraordinarily high saving and investment rates. In Singapore the ratio of investment to gross domestic product (GDP),

in constant dollar terms, rose from 11 percent in 1960 to a high of 47 percent in 1984, after which it fell back to 40 percent. In South Korea, the investment ratio rose from roughly 5 percent in the 1950s to 40 percent by 1991. In Taiwan, the investment ratio increased from 10 percent in the 1950s to above 20 percent in the 1970s and 1980s (Young 1994, figure 1).

The high and increasing investment rates have sustained rapid capital accumulation. Average annual growth in the capital stock is estimated to have ranged from roughly 10 percent to 12 percent in the NIEs over the past three decades. In the United States, for comparison, it has averaged only 2.9 percent a year since 1948.

Employment has also grown rapidly. In addition to large cohorts entering the labor market, rising female participation rates helped to fuel growth in labor supply. Aggregate participation rates rose between 1966 and 1991, for example, from 27 to 51 percent in Singapore, 38 to 49 percent in Hong Kong, and 28 to 37 percent in Taiwan (Young 1994, table 1-1). Substantial investments in human capital also boosted the "effective" labor supply. Between 1966 and 1991 the portion of the working population with at least secondary schooling increased from 16 percent to 66 percent in Singapore, 7 percent to 75 percent in South Korea, 26 percent to 68 percent in Taiwan, and

*The NIEs have experienced average annual growth rates in excess of 7.4 percent—in contrast with the United States, where postwar growth has averaged only 3.0 percent.*

**Table 5.** Growth in gross domestic product (GDP), capital stock, and employment: the Asian NIEs, recent periods

Country and period	Average annual growth rates (%)		
	GDP	Capital stock	Employment
Hong Kong, 1966–90	7.4	9.7	2.7
Singapore, 1964–90	8.6	11.4	4.8
South Korea, 1960–90	8.3	12.2	3.1
Taiwan, 1953–90	8.3	9.7	2.8

Source: Kim and Lau (1993, table 3.1).

*It appears that capital accumulation is by far the most important factor in the rapid growth of these dynamic economies. Technical progress has not been an important source of growth, and increases in labor supply have made only modest contributions to growth.*

27 percent to 71 percent in Hong Kong (Young 1994, table 1-2).

Recent studies have estimated the relative contributions of capital accumulation, labor-supply growth, and TFP growth to economic growth in the NIEs (World Bank 1993; Young 1992 and 1994; Kim and Lau 1993). Although estimates vary and debate over the studies' findings continues, it does appear that capital accumulation is by far the most important factor underlying the rapid growth in these dynamic economies.

A 1993 World Bank study, for example, estimates that two-thirds of the growth in the successful East Asian economies has been due to rapid accumulation of physical and human capital. Kim and Lau (1993) estimate that capital accumulation accounts for 63 to 77 percent of the growth in the NIEs over the past three decades.

These studies conclude that technical progress has not been an important source of growth in the Asian NIEs. Young (1994) estimates that TFP growth between 1966 and 1990 was low. Kim and Lau (1993) contrast the role of technical progress in the NIEs with that in the group of five advanced economies known as the G-5 (France, Japan, former West Germany, the United Kingdom, and the United States), where technical progress has played the most important role, accounting for 45 to 68 percent of economic growth.

Increases in labor supply are estimated to have made only modest contributions to growth in the NIEs. Kim and Lau (1993), for example, attribute only 9 to 20 percent of the growth to this factor. Such estimates suggest that slower labor force growth may not substantially curb economic growth rates, given the relatively small contribution of labor to growth.

Increased labor scarcity, however, could have an indirect impact on economic growth by adversely affecting capital accumulation.

## DECLINING RETURNS TO CAPITAL

Although employment growth has been rapid in the NIEs, growth in capital stocks has been much more rapid, and capital per worker has been rising dramatically. On average across the NIEs, the capital stock has grown 3.3 times faster than employment since the 1960s. The figures in Table 5 suggest that capital-to-labor ratios in these economies have been growing in excess of 6.5 percent annually. Slower labor force growth could accelerate the rise in capital-to-labor ratios. The concern is that increases in capital per worker will cause the returns to capital to fall, diminishing the effect of capital accumulation on economic growth.

There has been a lively theoretical and empirical debate over whether the returns to capital do decline. Neoclassical growth theory assumes that increases in physical and human capital have diminishing returns. This implies that economies cannot rely on high rates of investment and capital accumulation to sustain growth indefinitely. More recent, endogenous growth theories argue, however, that because of economies of scale or positive externalities, the returns to capital need not decline.

Some evidence indicates that the returns to capital have been declining in the NIEs. Young (1994) argues that neoclassical growth theory does explain the postwar experience of these economies. Moreover, he estimates that output per unit of capital input in Singapore, South Korea, and Taiwan has been falling over the past two and a half decades. Kim and Lau (1993) also find that the NIEs' out-



put elasticity of capital has been declining substantially over time. They conclude (p. 31) that

as their capital stocks continue to grow, the capital elasticities will continue to decline, and increases in the capital input alone will not be sufficient for the East Asian NICs [newly industrialized countries] to maintain their current rates of economic growth. It will be necessary for the East Asian NICs to devote greater proportions of their resources to research and development and to innovations in order to attain a positive rate of growth in productive efficiency (technical progress). . . . It may also be necessary for the East Asian NICs to upgrade further the quality of their investment in human capital and in the "software" necessary to realize the full productive potential of technology.

The much slower labor force growth projected for the NIEs should exacerbate the decline in returns to capital, thereby limiting further their ability to grow through accumulation alone. It will also force them to place more emphasis on increasing the rate of technical progress.

Governments in the NIEs appear to be acting on these concerns. They are promoting the drive into more skill-intensive, higher value-added sectors by encouraging investments in these industries. Governments are also supporting industrial restructuring by spending heavily on education, thereby increasing the supply of highly skilled labor. In an effort to spur technical progress, some of the NIEs are also spending heavily on research and development.

These economies are also responding to labor scarcity by encouraging greater labor force participation among their populations. Increasing numbers of women are entering and remaining in the labor market. Later retirement is another emerging trend, which will become more important as the NIEs' populations age rapidly over the next few decades. Governments and firms should encourage later retirement by abolishing mandatory retirement practices, revising seniority-based compensation schemes, and promoting the retraining of older workers.

## CONCLUSION

To varying degrees, the NIEs have been facing the challenges posed by labor scarcity for quite some time now. Rising labor costs have forced firms and workers to move out of labor-intensive production and into skill-intensive, higher value-added sectors. Demographic trends suggest that this trend must continue. Labor force growth in these economies is projected to decline dramatically. Moreover, aging of the work force should cause labor costs to rise; and the increasing scarcity of labor may constrain economic growth, which has been based primarily on capital accumulation.

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