Health Status of The Elderly and Their Labor Force Participation in the Developing Countries along the Asia-Pacific Rim

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The discussions and analyses presented in this paper indicate the predominant role played by families in providing both financial and emotional support to the elderly in Asia. As represented by their high labor force participation rates by international standards, however, a substantial proportion of old Asians support themselves through employment, mostly in agriculture or other industries with low productivity. On the other hand, the availability of resources through the public support system is still severely limited in most Asian countries. There are a number of indications, however, that as a consequence of fertility and mortality declines, coupled with rapid industrialization and urbanization, family size and structure have already been shifting in many Asian countries, so that the pattern of support systems, both personal and public, has been changing pronouncedly in recent years.

In the years to come, the role of public support for the elderly compared with family support is likely to become increasingly important, thus approaching the pattern prevailing in the West, but many policymakers in Asian countries take a negative view of the experiences of the Western industrialized nations(Martin, 1988). One of the reasons is that these policymakers are aware of the dilemmas currently facing the Western industrialized nations in maintaining their social security programs. The other reason is that Western-style values and institutions erode traditional support systems for the aged. There are numerous psychological and emotional elements involved in institutionalizing support for the elderly, and the marked differences in social and cultural factors between the Asian countries and the Western industrialized nations make it difficult for the former to use to old-age support systems prevailing in the latter as a model.

It is important for Asian policymakers to take into consideration the fact that Asia's aging process is expected to be extremely fast, and that it is likely to accelerate at a lower level of economic development, compared to the high level in the West. Besides, Asia's sociocultural setting is markedly different from that for the Western industrialized countries. For these reasons, Asian countries in the process of rapid population

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aging need to implement their own unique policies and programs to cope with a wide range of adjustment problems likely to occur in the foreseeable future. If such policy adjustment responses are slow and inappropriate, the well-being of the elderly will be seriously affected, and their valuable human resources will be wasted.

I. Introduction

Until the early 1980s, many of the governments of developing countries in Asia perceived that population aging was an issue only among developed nations. As a consequence of their rapid fertility declines over the past few decades, however, these Asian governments have become increasingly aware of various aging problems in their own countries which require more focused attention in the process of formulating their long-term development plans. It should be stressed that because the fertility transition in these developing countries in Asia has been substantially shorter than in the developed nations, the speed of population aging in the former has been and will be considerably faster than that observed in the latter(Leete, 1987). Moreover, although at present the mortality effect on population aging is limited in most of these Asian developing countries, if the recent trends in remarkable mortality improvement continue, mortality at advanced ages will fall pronouncedly in the relatively near future, thus further contributing to population aging (Myers, 1988).

Both fertility declines and mortality improvements affect not only the proportion of the elderly in the total population at the macro level but also the elderly people's way of life at the micro level. As a consequence of lowered fertility, each old person has fewer children to depend upon for the sake of old-age security(Martin and Culter, 1983). Due to the extention of longevity, old persons may need to modify their retirement plans(Livi-Bacci, 1982).

Besides the fertility and mortality changes, the urbanization process is likely to affect the welfare of the aged. Urbanization, which is both an antecedent and consequence of economic development (Hauser, 1982 ; Ogawa, 1985a), tends to lead to an increase in the unmber of nuclear families and to a decrease in the number of traditional joint families. It also brings about numerous life-style changes not only among the young but also among the aged. In parallel with such changes in family structure and life-styles, ecocomic development induces a rise in rural-urban mobility of the young, which in turn poses geographical obstacles to reciprocal family aid. Economic development also facilitates vertical mobility, which places parents and offspring in different social classes, consequently weakening the filial relationship(Davis and van den Oever, 1981).

As a consequence of these demographic changes coupled with economic development, the pattern of support for the elderly has been gradually shifting from informal family support to formal public support in a number of developing countries, particularly along the Asia-Pacific rim(Martin, 1988). However, most of these countries are still at an early stage of this transition, and a considerably higher

proportion of the elderly in the Asian and Pacific rim area, compared with the aged in the developed region, are still in the work force to support themselves as well as their families.

Although there are a host of factors affecting labor force participation among the elderly, a number of past studies (Boskn, 1977 ; Zabalza, Pissarides and Barton, 1980) show that the health status of the aged plays an important role in determining whether or not they participate in the work force. In virtually all populations, older age groups experience more illness and need more health services than younger age groups. Due to limited access to health care in both public and private sectors, however, the health condition of the elderly in the developing countries along the rim is generally less favorable than those in developed nations (Ogawa, 1990a). It should be stressed that health is not only an vital determinant of achieving and of maintaining and societal well-being, but also a primary lever for initiating the development process (Maddox, 1982).

This paper examines the relationships between two key factors in human resource development, i.e., the work pattern of the elderly and its relationship with their health status. To achieve this objective, we heavily draw upon micro-level data recently gathered in Thailand and South Korea. To facilitate the statistical analysis which follows, we first review the demographic profile of the aged population and their socioeconomic status in developing countries along the rim in the next section. In section III, we attempt to analyze the effect of a change in the health status of elderly persons upon their labor force participation in the two Asian countries at different stages of ecocomic development.

II. The Elderly in the Asia-Pacific Rim Area : A Demographic Profile and Socioeconomic Status

Demographic Status

The population aged 65 and over in the three subregions of Asia(East, Southeast and South Asia) was estimated at 128.3 million in 1985(United Nations, 1989). These elderly persons correspond to

Table 1. International Comparison of the Proportion of Those Aged 65 and over in 1985.

Asian Countries		Industrialized Countries	
Country	Percentage of aged population	Country	Percentage of aged population
Japan	10.3	Australia	10.1
Philippines	3.4	New Zealand	10.5
Indonesia	3.6	U. S. A	11.9
Thailand	3.6	France	13.0
Malaysia	3.8	Switzerland	14.6
South Korea	4.3	West Germany	14.7
Singapore	5.2	United Kingdom	15.1
China	5.3	Norway	15.5
Hong Kong	7.6	Sweden	17.9

Source : United Nations. 1989. *World Population Prospects 1988*, New York

4.7 percent of the total population living in the three subregions, which is considerably lower than that for the developed region (11.5 percent), and slightly below that for the world total (6.0 percent).

Table 1 compares the proportion of the population at ages 65 and over for selected countries along the rim and Western countries in 1985. In the Asia-Pacific region, Japan's population is by far the most aged ; 10. 3 percent of her population are those aged 65 and over. Japan is followed by Hong Kong (7.6 Percent), Chica (5.3 Percent), and Singapore (5.2 percent). Although Japan's population is pronouncedly aged among the countries in the Asian and Pacific region , it is still young relative to the populations of most Western industrialized countries.

All the populations along the Asia-Pacific rim are projected to age substantially over the next few decades (United Nations, 1989). As discussed elsewhere (Ogawa, 1988a), most of these populations are expected to show a marked increase in the proportion of old-old persons(75 years of age and over). Moreover, due to the difference in life expectancy at higher ages between males and females, each of these populations is projected to undergo a pronounced predominance of women among the elderly.

It should also be emphasized that the nexus between the development of an urban-industrial economy and population aging observed in the present-day developed countries will not be as close in these Asian-Pacific countries(Jones, 1988). Some Asian countries such as South Korea and Malaysia are likely to be as urbanized and industrialized as Western industrialized countries were when they became aged. In contrast, other Asian countries along the rim, such as China and Thailand, will become aged societies at considerably lower levels of urbanization and agro-industrialization. Owing to this difference in population aging in the context of development between Asia and the West, the applicability of the aging policies formulated in the Western industrialized nations to these Asian countries seems to be rather limited.

More importantly, the speed of population aging is likely to accelerate in some of the countries along the rim in the early part of the next century. For instance, between the years 2000 and 2025, the aged population is expected to increase from 7.0 to 13.0 percent in China, from 10.8 to 21.0 percent in Hong Kong, from 6.3 to 13.9 percent in South Korea, from 7.1 to 19.1 percent in Singapore, and from 5.0 to 10.2 percent in Thailand. These projected results indicate that the tempo of population aging in these Asian countries along the rim is substantially faster, compared with that for the Western industrialized populations. For this reason, these Asian countries will go through an extremely compressed process of population-development interactions, and thus is likely to lead to a host of difficult adjustment problems at various familial and societal levels.

Socioeconomic Status of the Elderly and Family Support

Let us now turn our attention to more proximate demographic factors which may influence the degree of support across generations. In the recent past, demographers have been increasingly referring to what has been termed "familial support ratios", to assess the availability of intergenerational family support for the elderly(Myers, 1988). These ratios, which relate the population at ages 45-49 to those

Table 2. Familial Support Ratios for Selected Asian Countries, 1985 and 2025.*

Country	1985	2025
Hong Kong	0.74	0.37
Japan	0.80	0.38
China	0.95	0.56
Singapore	1.10	0.35
Philippines	1.21	1.01
Malaysia	1.24	0.80
Thailand	1.28	0.83
Indonesia	1.35	0.95
South Korea	1.38	0.59

*Familial support ratio=(those aged 45-49)/(those aged 65-79).Source : Same as Table 1.

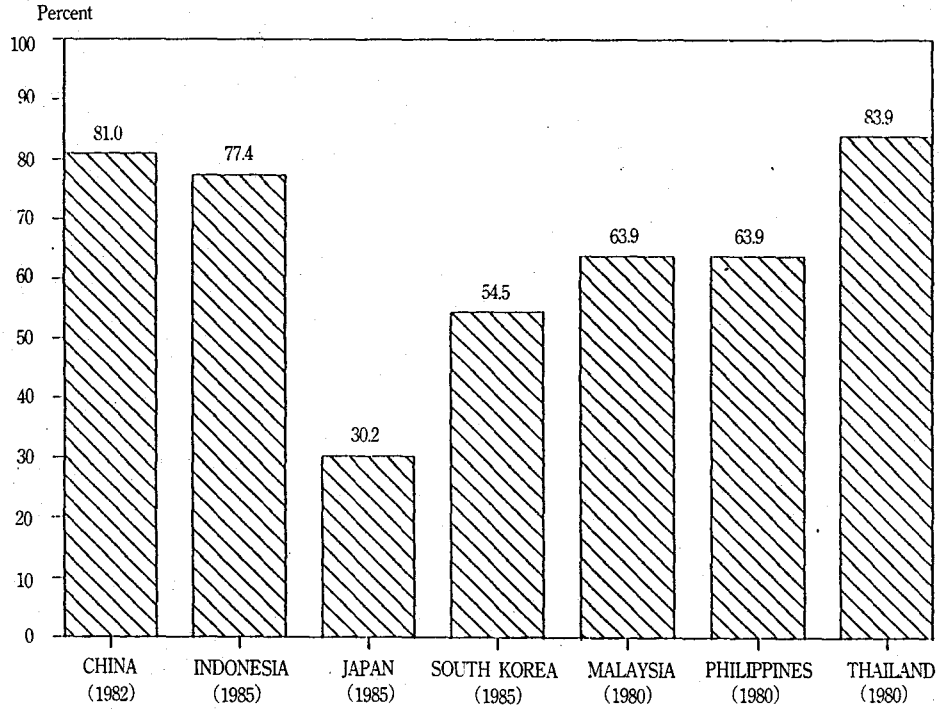
aged 65-79, enable us to evaluate number of adult children in terms of a single generation of parents who would have borne them at ages 15 through 34. Table 2 presents the familial support ratios for the nine countries along the rim in 1985 and 2025. Over the next four decades, all the countries are expected to face a fast reduction in the demographic potential of familial support by adult children for the elderly. Such declining trends are particularly pronounced in Japan, China, South Korea, Hong Kong and Singapore. In these countries, manpower resources for the provision of home care will be increasingly scarce in the years ahead.

A more relevant measure for assessing the availability of family support is the Living arrangements for the elderly which are often taken as a first indicator of family relations. One of the national sample surveys undertaken in South Korea in 1985 shows that 79 percent of 1,856 respondents aged 60 and over were living with their children (Choi, 19 85). A sample survey conducted in one of the provinces in northern China in 1983 found that 79 percent of the rural elderly were living with their children(Qu, 1984). According to recent World Health Organisation(WHO) surveys on the elderly, 72 percent of Malaysians aged 60 and over were living with their children, and the corresponding figure for the Philippine counterparts was 79 percent (Andrews et al., 1986). Data gathered from the ASEAN aging survey gave yielded a highly comparable result ; over 70 percent of the elderly were living with their children in the four ASEAN countries(Singapore, Malaysia, the Philippines and Indonesia) (Chen and Jones, 1989). Furthermore, an international comparative study carried out in 1986 covering five countries (Japan Management and Coordination Agency, 1987), indicated that in Thailand, 48.5 percent of the elderly aged 60 and over were residing in a three-generation arrangement. In sharp contrast, only 0.2 percent of the elderly aged 60 and over in Denmark, 0.5 percent in the United States, and 14.1 percent in Italy were living in a three-generation household.

The multigenerational living arrangements tend to facilitate intergenerational familial support, both economic and non-economic, from adult children to their elderly parents. this pattern of support for the elderly is documented by some of the micro-level survey findings. According to recent WHO surveys on the elderly cited earlier, in the case of

South Korea, the sources of their income were from family(67 percent), work(19 percent), pensions (6 percent), and others(8 percent). As for the Malaysian respondents, the percentage distribution of these responses was 62, 19, 14, and 5 percent, respectively, while it was 54, 22, 13, and 11 percent for the Philippine elderly. A similar pattern of main income sources for the elderly can be observed among other Asian countries(Singapore, Thailand and Indonesia), as demonstrated by data gathered from ASEAN's recent surveys on aging(Chen and Jones, 1989). Taking Thailand for example, 53 percent of the respondents stated that their main income source was their families, while 28 percent chose the category of "work", and 2 percent, "pensions". It is also important to note that data from both WHO and ASEAN surveys show that these percentage distributions vary substantially with age and sex. For instance, older respondents and women particularly likely to report dependence on the family as the main source of income. In the male population, decreasing involvement in the paid work force is also associated with increased dependence on the family for financial support. In addition to this, pensions become an important source of income, particularly for men over 65 years.

It should be borne in mind, however, that although support for the elderly remains a family re-



Source : United Nations. 1989. Demographic Yearbook 1987, New York.

Figure 1.Percentage of Those Aged 65 and over Residing in Rural Areas in Selected Asian Countries in Recent Years

Table 3. Labor Force Participation Rates for Males and Females Aged 60 and over in Selected Countries Circa 1980.

(unit : percent)

Country	(Year)	Males		Females	
		60–64	65 and over	60–64	65 and over
		Asian countries			
China	(1982)	63.7	30.1	16.9	4.7
Hong Kong	(1986)	59.2	29.7	25.9	12.1
Indonesia	(1980)	76.7	53.4	32.9	19.0
Japan	(1985)	78.3	41.6	37.9	15.2
South Korea	(1980)	68.8	40.6	31.3	13.0
Malaysia	(1980)	69.0	49.4	26.7	18.9
Philippines	(1975)	84.1	62.4	19.5	13.6
Singapore	(1980)	52.5	28.6	11.3	6.4
Thailand	(1980)	69.6	39.0	38.1	17.6
		Western countries			
France	(1982)	39.1	5.0	22.4	2.2
Sweden	(1985)	63.2	11.3	45.6	3.1
United Kingdom	(1981)	74.5	10.8	22.3	3.7
United States	(1980)	60.4	19.3	34.0	8.2

Source : International Labour Office. 1988.
Yearbook of Labour Statistics, Geneva.

sponsibility in most Asian societies, the extent to which family support is provided to old persons differs in urban and rural areas ; the traditional family support system is more widely practiced in rural areas than in urban areas(Gibson, 1988). Figure 1 illustrates the intercountry differences in the proportion of the elderly residing in rural areas in the early 1980s. From this figure, we can observe that the majority of aged persons in the developing countries along the Asia–Pacefic rim are still living in rural areas.

Moreover, largely because the predominant portion of the elderly in these developing countries inhabit rural areas where poverty is prevalent, their labor force participation rates are considerably high. Table 3 displays the age–sex–specific labor force participation rates among the elderly for selected countries in both Asia and the West. The data reported in this table show that there are substantial differences in the labor force participation rates between the two groups, particularly among those aged 65 and over, regardless of sex. Among the nine Asian countries included in this table, the male labor force participation rate of those aged 65 and over is the highest in the Philippines (62. 4 percent), while the corresponding figure for women is 19.0 percent for Indonesia. In contrast, among the four selected Western nations, the United States has the highest labor force participation rates of those aged 65 and over, i.e., 19.3 percent for men and 8.2 percent for women.

In a society where public income support is rarely provided to the elderly, the deterioration of their health conditions is often onset of their retirement life(Petri, 1982). In the WHO surveys on aging, each respondent was asked to evaluate their

health. In South Korea, 54 percent of the male respondents felt healthy, compared with 45 percent of their female counterparts. In Malaysia, most people (72 percent) reported that they felt healthy, and no sex difference was noted. In the Philippines, 84 percent of the elderly responded positively to this question, but there was a small sex difference. The WHO data also show that contrary to the stereotyped view that the elderly are incapacitated and therefore unable to control their lives, most respondents in these Asian countries along the rim were able without help to cope with almost all activities of daily living(ADL). Despite such high overall positive self-asssessment of health, the data reveal that there was a general deterioration in reported health status with advancing age.

Comparable results emerged from data from the ASEAN aging survey which collected a range of information about the health and disability status of the aged. In Malaysia, the Philippines, and Thailand, from one third to almost one half of respondents reported a significant health impairment over the previous year prior to the survey, the figures being higher for women than for men and increasing with age. Moreover, data gathered in Thailand indicate that because of the high incidence of multigenerational living arrangements, spouse and children are the caregivers in the great majority of cases of illness among the elderly. Although the information is available only for Thailand, it is likely that the situation does not differ very much in the other ASEAN countries (Chen and Jones, 1989).

The foregoing discussions point to the demographic and socioeconomic profile of the elderly in the developing region along the rim as follows : the majority of the elderly are living with their children and in rural areas ; families continue to provide most income, health, and supportive services required by older people ; and more importantly, a substantial proportion of the elderly are healthy and engaged in economic activities.

Availability of Public Support

In the process of economic development, however, this general profile of the elderly in Asia has been gradually changing in recent years, partly in response to improved public support programs. As suggested by the modernization hypothesis (Cowgill and Holmes, 1972), in parallel with socioeconomic development, the responsibility for the provision of economic security for the dependent elderly tends to be shifted from the family to the state. A simple intercountry data analysis suggests the possibility that as the level of economic development is heightened, the pattern of allocation of support resources changes from informal support (Ogawa, 1990b).

In the Asia-Pacific rim countries, however, the relative share of the social security expenditure in GDP is considerably lower than that of Wetern developed nations. In the early 1980s, for instance, it was 1.7percent for Malaysia, 0.6 percent for the Philippines, 5.2 percent for Singapore, and 0.2 percent for Thailand(International Labour Office, 1988). In Asia, Japan is an exception ; 10.9 percent of her GDP was allotted to the social security program in 1982-3. In corresponding figures for Western industrialized nations are much higher ; it was 28.0 percent for France, 32.6 percent for Sweden, and 19.5 percent for the United Kingdom.

In most countries along the rim, public pensions, which are one of the core components of the public

support system, are available to only a small proportion of the elderly—usually those living in urban areas. Singapore's Central Provident Fund, which was established in 1953, covered 36 percent of 54—year—olds in 1983(Jones, 1985). This system has been under operation with the principle of equity ; each individual has his/her own account. Similarly, a number of developing Asian countries have instituted such provident fund schemes. In Malaysia, the provident fund, instituted in 1952, covered approximately 73 percent of the work force in 1981. In other countries along the rim, provident funds are also in operation, but on a more limited scale. Indonesia serves a case in point. In the Philippines, social insurance schemes are available, though they are at a premature stage(Jones, 1988). In Thailand, the existing old—age pension plans cover government employees, state enterprise employees, and private enterprise employees (Kiranandana, Wongboonsin, and Kiranandana, 1988). In 1985, it was estimated that only 7 percent of the elderly aged 60 and over received benefits from these highly urban—based pension plans. In China, in 1981, 45 percent of urban retirees are pension recipients, as opposed to 1.5 percent for rural retirees(Ogawa, 1988b). Because of such limited coverage in rural areas, the rural aged continue to work as long as their physical coditions permit.

In addition to public pensions, the government medical service program is a major component of the social security system. As compared with pensions, health care is more widely available to the elderly of Asia. However, the adequacy and accessibility of health care differs from country to country as well as within each country. In China, for example, urban elderly retired from state—owned enterprises receive free medical care services, whereas the medical care costs of all other urban elderly are paid by municipal governments. In rural areas, most brigades have cooperative health plans(Yang, 1988). In Singapore, a part of each person's account in the Central Provident Fund has been used for the Medisave program since 1984. In Malaysia, comprehensive health and medical services have been available to the general population, but not specifically for the elderly.

Moreover, data collected from the WHO surveys on aging indicate that 9 percent of Malaysians and 16 percent of Filipinos felt that they needed more medical care than they were already obtaining. The desire for more medical services was distributed evenly across both sexes, all age groups, and rural/urban boundaries. In South Korea, almost half believed that their medical care was inadequate. It is important to note that the WHO survey results show that the main reason for not having received medical services was that they could not afford it.

The above cursory overview of pension and medical programs currently available for the elderly in the Asian developing countries along the rim attests to the fact that both the scope and depth of social security provision is limited by their overall level of socioeconomic resources and competing demands upon these resources by different social groups. Put differently, in the developing countries along the Asia—Pacific rim, family members provide economic support to older relatives, as well as serving as front—line health caregivers, while the public sector plays a marginal role. In view of the recent demographic and socioeconomic developments, however, many of the governments have been increasingly aware of the necessity of improving public support

to needy older persons. In fact, the crucial question facing these governments is the extent to which they should assist the elderly families and the level of resources to be allocated. There is little doubt, however, that such improved public support programs will have an impact on the health status of the Asian elderly as well as their labor force participation, which is the main focus of the next section.

III. Labor Force Participation and Health Status of the Aged : A Micro-Level Analysis

As discussed earlier, a considerable number of significant crossnational surveys on aging have been conducted in a number of developing nations along the Asia-Pacific rim in the recent past. Despite a variety of survey methodological and statistical shortcomings in them, valuable baseline data on the demographic and socioeconomic status of the elderly have been obtained (Martin, 1989a). Because most of these sample surveys have been based upon a broad-ranging core questionnaire, some crossnational comparative analyses have recently been carried out (Martin, 1989b ; Manton, Myers and Andrews, 1987 ; Chen and Jones, 1989).

Following along a similar line of research interest, we attempt to analyze the nexus between the labor force participation of the elderly and their health status, on the basis of micro-level data gathered from recent surveys undertaken in South Korea and Thailand. Data for South Korea were collected in 1988 as part of the ESCAP aging survey project, while those for Thailand were gleaned from the national survey on the aged conducted in 1986 as part of the ASEAN aging project.

These country data sets are considerably different from each other in terms of survey objectives, scope, coverage, sampling designs, and data collection methods. For instance, the South Korean survey covered elderly persons at ages 60 and over (798 respondents) as well as their resident primary care providers (538 respondents). Although these respondents were selected from both rural and urban areas, information gathered was not expected to be nationally representative due to a lack of proper weights. In the case of the Thai survey, data were collected from 3,252 respondents aged 60 and over. Because a detailed description of each of these surveys has been available elsewhere (Choe, 1988 ; Chayovan, Wongsith and Saengtienchai, 1988), no further discussion on the nature and scope of each data set is in order. In addition, in view of the differing degree of the availability of information on the elderly between the two country surveys, we heavily draw upon the Thai data set as a main source of information for analysis, and use the South Korean data set for crossnational comparison to a maximum possible extent.

Table 4 compares labor force participation rates of the elderly in both Thailand and South Korea by respondents characteristics. Although the computed rates are substantially higher in South Korea than in Thailand, both countries show a comparable pattern of labor force participation with respect to each selected characteristic. The labor force participation rates decline with an increase in age, and are higher among men than among women. Rural elderly persons show a higher participation rate than their urban counterparts.

More improtantly, those who are healthy have a

Table 4. Labor Force Participation Rate of the Elderly by Age, Sex, Urban−Rural Residence, and Health Status, Thailand in 1986 and South Korea in 1988.

(unit : percent)

Respondent's Characteristics	Thailand 1/	South Korea 2/
Age		
60−64	41.2	61.2
65−69	34.7	47.8
70 and over	16.8	40.8
Sex		
Male	39.5	61.3
Female	23.2	38.9
Place of residence		
Urban area	22.9	26.5
Rural area	32.4	87.5
Health status		
Healthy	34.2	55.9
Not healthy	23.6	37.8

1/ Number of cases=3,074.
2/ Number of cases=797.

higher propensity to participate in the work force than those with poor health status. Similar to many surveys such as the Retirement History Survey in the United States (Stern, 1989), information on the status of health is not physician diagnosed but self−reported in both Thai and South Korean surveys. In the Thai survey, each respondent was asked to evaluate his/her own health status during the past week prior to the survey, and to select one of the following response categories : (i) "excellent," (ii) "good," (iii) "fair," and (iv) "not healthy." The percent distribution of responses was 3.8, 31.4, 24.2, and 39.7 percent, respectively. To compute the participation rates shown in Table 4, we have combined the first three categories into a new category of "healthy." In the South Korean case, each respodent was asked about his/her health status at the time of the survey, and the response categories were dichotomous ; "healthy" (59.1 percent) and "not healthy" (40.9 percent). It should to noted that the percent distribution of the "healthy" vs. "not healthy" is highly comparable between the two surveys.

The foregoing tabular results indicate that the probability of older persons being in the labor force varies considerably with their demographic and socioeconomic characteristics. In the rest of this section, we identify the factors determining whether or not elderly person stays in the labor force. For this purpose, we conduct a logit analysis by introducing a variety of plausible explanatory variables into the participation equation. The dependent variable is of the dichotomous nature ; it takes a value of 1 if an old person participates in the labor force, and

otherwise 0. Based opon a number of previous empirical analyses (Boskin, 1977 ; Zabalza, Pissarides and Barton, 1980) and our discussion on the profile of the elderly in Section II, the explanatory variables have been chosen from both surveys. For the Thai case, these variables include(i) sex(male, female*), (ii) age (60−64, 65−69, 70−74, 75 and over*), (iii) marital status (married, not married*), (iv) religion (Buddhist, non−Buddhist*), (v) educational attainment (no education*, grades 1−3, grade 4, grade 5 or higher, other education), (vi) current place of residence (urban, rural*), (vii) number of consumer durable goods avaiable in each household, (viii) number of living children, (ix) whether or not the main income source is a pension, and (x) health status (healthy, not healthy*). In the foregoing description of the explanatory variables, some of them are of the classificatory nature, and the omitted category has been indicated by an asterisk. Moreover, although information on household structure was gathered in the survey, due to the fact that it has not been coded at the time of the present analysis, we have used as a proxy to number of living children.

For the South Korean case, a comparable set of explanatory variables have been selected. It should be noted, however, that due to the unavailability of required data, the variable representing the number of consumer durables (or its proxy) has been excluded. In addition, a respondent's educational attainment is defined differently, i. e., (no education*, primary school, middle school, high school or higher).

One of the key predictor variables is a respondent's health status. It is often considered that the health status variable is endogenous. Overlooking the endogeneity of this variable would tend to bias the impact of an old person's health condition upon his/her labor force participation. Unfortunately, due the fact that the available data in both the Thai and South Korean surveys did not provide a sufficient number of good instruments to carry out estimation, no practical to this potential estimation problem is available in the present study. In addition, Stern (1989) has recently demonstrated, using two survey data sets for the United States, that there is only weak evidence of endogeneity of health statusrelated variables. Furthermore, a large number of earlier studies on health and labor force participation among the elderly have assumed that the causational relationship is predominantly one−way from the former to the latter (see Boskin, 1977 ; Zabalza, Pissarides and Barton, 1980). It is also important to note that in Stern's study, an elderly person's health status has proved to affect his/her participation nonlinearly. For this reason, we run an alternative logit regression with a health status variable representing diminishing health from excellent to poor. It should be noted, however, that this alternative run is feasible only for the Thai case, due to the unavailability of necessary information in the South Korean data set.

A respondent's educational attainment, which represents a level of his/her human capital, is expected to be related to his/her labor force participation. The greater his/her human capital, the higher the probability of his/her participating in the work force. It is also conceivable that the effect of educational attainment upon participation may be mediated through health status. As regards a respondent's marital status, the presence of his/her spouse is likely to motivate him/her to stay in the labor force

to support the spouse. At the same time, it is plausible that the presence of the spouse will increase household income through his/her participation in the labor force (Boskin, 1977). The net effect of these two opposite forces is subject to empirical tests. The number of consumer durable goods is a proxy for income from assets ; the greater the number of consumer durable goods, the less likely a respondent is to work. The number of living children, which is a proxy for the variable representing household structure, is expected to capture the effect of informal familial support for their aged parent upon his/her participation. Older persons who have a greater number of living children are less likely to encounter serious financial needs, thus reducing their probability of being in the work force. A respondent's religion is introduced into the equation in hopes of capturing his/her values toward work, although the direction of its impact is ambiguous. The elderly who receive pensions are more inclined to withdraw from the work force. It is more desirable to employ a variable representing whether or not the elderly receive pensions ; due to the limitation of data, however, a dummy-coded variable indicating whether or not their main income source is a pension is used as a proxy.

Table 5 presents the estimated results for the two different logit regressions for Thailand, i.e. ; the base run with the dichotomous health status variable imcorporated and the alternative run with the ordered health status variable used. Because these two regressions show highly comparable results, we mainly discuss the results for the base run. All the explanatory variables, except for religion, educational attainment and the number of consumer durable goods, have estimated coefficients which are not only statistically significant but also consistent with theoretical predictions.

The health status variable which is the principal, predictor in the present analysis, has a positive coefficient, thus suggesting that better health facilitates labor force participation. Its impact is substantial. The elderly with good health have a higher probability(0.097) of being in the work force, compared with those having poor health. Moreover, its impact is much greater in the case of the alternative run. The elderly with excellent health status, compared with those with poor health status, have a much higher probability(0.185) of participating in the work force. More importantly, the effect of improvements in health status on participation is nonlinear, as has been found in the other studies(Stern, 1989). For example, if the health status of the elderly is "fair" rather than "poor" their probability of working increases by 0.081. Improved health from "fair" to "good" has a much smaller effect (0.018), while the change in health status from "good" to "excellent" leads to an increase in their probability by 0.086. These results indicate that the marginal gains are pronounced when health condition shifts from "poor" to "fair" and from "good" to "excellent".

All the coefficients for the age groups have positive signs, but their size declines with advancing age. This implies that an increase in age leads to a decline in the propensity to participate in the work force. The elderly aged 60-64, compared with those at ages 75 and over, have a higher probability (0.298) of remaining in the labor force. The corresponding figures for the successive five year age groups fall to 0.226 for those aged 65-69 and to 0.074 for those at ages 70-74. Male old persons

Table 5. Logit Regressions Coefficient for Lobor Force Participation of Old Persons Aged 60 and Over, Thailand, 1986.

Explanatory Variables	Parameter Estimates(T-Statistics) Base	Alternative
Intercept	-2.1514	-2.1131
	(-10.529)	(-10.294)
Male	0.6856	0.6682
	(6.956)	(6.757)
Age group		
60-64	1.4171	1.4095
	(9.724)	(9.644)
65-69	1.0750	1.0653
	(7.377)	(7.298)
70-74	0.3536	0.3582
	(2.177)	(2.203)
Currently married	0.6383	0.6376
	(6.380)	(6.367)
Buddhist	-0.0816	-0.0882
	(-0.988)	(-1.101)
Education attainment		
Grade 1-3	-0.0816	-0.0882
	(-0.595)	(-0.642)
Grade 4	-0.1230	-0.1185
	(-1.082)	(-1.241)
Grade 5 and over	0.0748	0.0627
	(0.380)	(0.318)
Other education	0.0221	0.0414
	(0.096)	(0.179)
Urban residence	-0.4495	-0.4589
	(-3.828)	(-3.898)
Number of consumer durable goods	-1.0173	-0.0185
	(-0.893)	(-0.953)
Number of living children	-0.0447	-0.0455
	(-2.773)	(-2.819)
Pension as the main income source	-1.7490	-1.7789
	(-4.999)	(-5.068)
Healt status		
Healthy	0.4652	
	(5.138)	
Excellent		0.8828
		(4.146)
Good		0.4734
		(4.573)
Fair		0.3853
		(3.435)
Log-likelihood	-1625.0	-1622.4

N=2,999.

* Both means and standard deviations of the explanatory variables are listed in Appendix Table 1.

are more likely to work than their female counterparts. The older persons become, the less likely they are to stay in the labor force. Those who are married, compared with those not married, have a considerably higher probability (0.134) of being in the labor force. The elderly living in urban areas have a substantially lower probability (−0.094) of working than those in rural areas. The larger the number of living children, the less likely their aged parents are to participate in the labor force.

The elderly with a pension as a main income source have a large negative propensity to work, compared with those depending upon other income sources. The probability of the former being in the labor force is lower by 0.367 than that of the latter. It should be noted, however, that because the proportion of those whose main income source is a pension is presently only 3 percent in the total sample, its impact upon the overall labor force participation rate is virtually negligible. Nevertheless, the pension inducement effect may play an increasingly important role in determining the labor force participation of the Thai elderly as their pension schemes expand and approach maturity in the years to come.

Based upon these estimated results, a profile of the computed agespecific labor force participation rate of the Thai elderly, as displayed in Table 6. For comparative purposes, we have selected as a reference group the following group of old persons : women who are not married, being Buddhists, having no education, living in rural areas, having 6 living children and 2 modern consumer durable goods, receiving no pension, and being healthy. For each explanatory variable which has a statistically significant effect on participation, we have introduced a value different from the reference group. A close examination of these calculated results reveals that the labor force participation rate for the Thai elderly change markedly, depending upon their de-

Table 6. Profile of Computed Age−Specific Labor Force Participation Rates for the Elderly in Thailand.

(unit : percent)

	Age group			
	60−64	65−69	70−74	75+
Reference group*	30.1	23.4	12.9	9.5
Male	46.1	37.8	22.8	17.2
Currently married	46.0	37.7	22.7	17.1
Urban residence	21.6	16.3	8.7	6.2
No living children	37.1	29.5	16.9	12.5
Pension	7.0	5.1	2.5	1.8
Not healthy	21.3	16.1	8.5	6.2

*See text.

mographic and socioeconomic characteristics. It ranges form 1.8 to 46.1 percent.

Table 7 compares the differences in the determinants of labor force participation between old men and women in Thailnd. Most of the determinants identified in these participation equations are comparable. It should be emphasized, however, that the impact of health status upon participation varies considerably between the sexes. The shift of health status from "not healthy" to "healthy" raises elderly men's probability of being in the labor force by 0.155, while the corresponding figure for elderly women is only 0.052. This implies that the effect of health improvements upon overall participation differs substantially, depending upon the extent to which health status improves for each sex.

The pension-inducement effect is significant for males, while it is virtually negligible for females, as expected from our earlier discussion in Section II. In contrast, the number of modern consumer durable goods affects women's participation considerably, whereas it has no impact on men's. It should be noted that in the women's equation, one of the educational attainment variables(Grade 4) has a negative coefficient that is statistically significant. Nevertheless, the computed value of -2 x loglikelihood is 7.16, compared with a chi-square critical value of 9.49. Thus, women's educational attainment variables as a group have virtually no impact upon participation.

If these cross-sectional results hold over time, they have some important implications for future changes in labor force participation among the Thai elderly. Demographically, the estimated results for age and sex suggest that because the aging process of Thai society is expected to accelerate and the feminization of the aged population is likely to become increasingly pronounced over the next few decades as discussed in the earlier section, the overall labor force participation rate of the elderly may decline substantially as Thailand approaches the end of demographic transition. Improved mortality, which is projeted to contitnue in Thai society, is likely to contribute to increasing the husband-wife joint survivorship, thus leading to a rise in the labor force participation rate. In addition, declining fertility, which has been under way for some time and is expected to persist in the years ahead in Thailand, will reduce the number of living children as well as family structure, which gives rise to a weakening of informal familial support, consequently motivating the Thai elderly to stay in the labor force.

Apart from these various demographic impacts, socioeconomic developmental factors will affect Thailand's future labor supply among old people. Further improvements of health status, which are closely intertwined with socioeconomic development, will lead to a rise in the participation of the elderly in the labor force. This positive effect upon labor force participation among the aged is likely to be offset to some extent by an increase in urbanization and the coverage of pension schemes, both of which are expected to grow rapidly in the 1990s and beyond (Cho and Bauer, 1987 ; Pernia, 1988 ; Kiranandana, Wongboonsin and Kiranandana, 1988). The net effect of these positive and negative impacts on participation is directly dependent upon Thailand's future demographic and socioeconomic developments.

Let us turn our attention to the estimated results for South Korea. Parallel to the Thai case, we have

Table 7. Logit Regressions Coefficient for Lobor Force Participation of Old Males Aged 60 and Over, South Korea

Explanatory Variables	Parameter Estimates and Test of Significance	
	Coefficients	T-Startistics
Intercept	1.8846	2.839
Age group		
60-64	2.0575	3.998
65-69	0.8500	1.657
70-74	0.6480	1.244
Currently married	0.6577	1.414
Buddhist	0.3066	1.974
Education level		
Primary school	-0.5635	-1.376
Middle school	-0.5682	-1.097
High school and over	-0.0456	-0.110
Urban residence	-4.0595	-6.949
Pension	-1.4004	-1.148
Health status		
Healthy	0.4719	1.520
Log-likelihood	-145.43	

N=344.

* Both means and standard deviations of the explanatory variables are provided in Appendix Table 3.

estimated three labor force participation equations, i.e., one for the whole sample, the other for males only, and another for females only. Because the health status variable has proved to have a significant effect upon participation only in the male equation, we confine ourselves to discussing the estimated results for the male case.

As indicated in Table 7, the estimated coefficient for the health status variable has a positive sign, and it is statistically significant at the 10-percent level with a one-tail test. The elderly with good health status, compared with those having poor health status, have a higher probability(0.112) of being in the work force. Although this computed probability is slightly lower than that for the Thai male case, it is still substantial. Thus, further health investment upon the Korean elderly is likely to lead to a considerable increase in labor supply, all else being equal.

A large impact upon participation is generated by the urban-rural classificatory variable. Those residing in urban areas, compared with their counterparts in rural areas, have a much lower probability (-0.962) of working in the labor force. Similar to the Thai case, both a respondent's age and marital status have a considerable impact on participation. Unlike the results for the Thai analysis, neither the pension variable nor the number of living children has entered into the equation.

Although we have estimated the female participation equation for the South Korean case, only age and urban-rural residence have shown statistically significant effect. In the case of Thailand, the effect of women's health status variable upon their participation was rather small but statistically significant. In contrast, in the case of South Korea, it was not

significantly different from zero. Moreover, the logit regressions have been undertaken for urban and rural samples separately, but the results have remained unchanged.

In addition to these logit regressions, we have attempted to estimate a few alternative cases for both the Thai and South Korean data sets. For instance, we have incorproated in the regression the health status variable that measures a respondent's ADL, but the computed results are basically the same with those presented. Following some of the earlier studies(Stern, 1989), we have tested the presence of interaction between sex and marital status. No significant effect, however, has been detected.

Ⅳ. Concluding Remarks

In the first half of the present paper, we have discussed (i) the trends and prospects of population aging and (ii) the demographic profile of the elderly in selected countries along the Asia-Pacific rim. We have also reviewed how both family and public support systems available for the elderly have been changing in these rapidly-aging countries. Based upon these discussions developed in the first half, we have analyzed, in the second half of the present paper, how and to what extent the labor force participation of the elderly and their changing health status are related with each other in the rapid demographic and socioeconomic developments in these developing nations. To facilitate the empirical analyses, we have heavily drawn upon micro-level data collected in Thailand and South Korea.

The discussions and analyses presented in this paper have indicated the predominant role played by families in providing both economic and noneconomic support to the elderly in the developing countries along the Asia-Pacific rim. However, as represented by their high labor force participation rates by international standards, a substantial proportion of old Asians along the rim support themselves through employment.

The emprirical results show that the health status of the elderly is one of the key variables affecting whether or not they participate in the labor force. This impact of the health variable upon participation is particularly pronounced in the case of old men in both Thailand and South Korea. In view of the fact that life expectancy at birth for both sexes combined is 65 years for Thailand and 70 years for South Korea(United Nations, 1989), both countries are likely to undergo substantial improvements of mortality and morbidity at older ages in the years to come. For this reason, the positive impact of the improved health status of the elderly upon their participation will be increasingly important in these countries.

However, the estimated results also show that there are several other factors likely to affect significantly the labor supply of the elderly. These factors include the age and sex compositional shifts of the aged, their marital status, the declining informal family support by adult children for the eldrly, urbanization, and the gradual improvements of pension programs. Because the labor force participation rate of the elderly declines with age, and the aging process of these countries is expected to accelerate in the 1990s and beyond, the overall labor force participation rate of old persons in each country may decline substantially as they approach the end

of demographic transiton. Moreover, because old men show a higer participation rate than old women, the projected predominance of the latter relative to the former is likely to further depress the overall labor force participation rate among the elderly. In contrast, both the elderly's marital status and the number of their living children, if their recent trends persist, are likely to contribute to raising the probability of old persons being in the labor foce. The last two factors, which are influenced by socioeconomic development, generate an opposite force. If these cross-sectional results hold over time, the net effect of these variables upon the labor supply of old people is subject to the extent to which each of them will change in the years ahead.

It is often argued that older individuals have fewer years of life remaining and thus, less time to enjoy the flow of utility resulting from a health investment(Grossman, 1972). There is no doubt, however, that elderly manpower constitutes one of the vital components of human resources(Clark, Kreps and Spengler, 1978). In order to maximize the utilization of an old but useful work force, therefore, appropriate policy measures and programs designed for keeping labor force participation among the elderly at a high level should be implemented in the course of future development in the developing countries along the rim. A gradual shift in retirement age is a salient example. In most of the countries along the rim, the current retirement age is 60. As their aging process advances, it should be raised to a higher age. This shift, however, requires changes in various factors related to the labor market, including the wage system. In view of Japan's recent experience on the extension of retirement age, however, this is not an easy task(Martin and Ogawa, 1988). In this context, Japanese experiences can be used as a lesson for other Asian countries along the rim whose populations are expected to age rapidly over the next few decades.

As mentioned earlier, there are a number of indications that as a consequence of fertility and mortality declines, coupled with rapid industrialization and urbanization, family size and structure have already been shifting in many Asian countries along the rim, and thus, the pattern of support systems, both personal and public, has been shifting in recent years. In the years to come, the role of public support for the elderly is likely to become increasingly important, relative to family support. However, the availability of resources through the public support system is still severely limited in most of these developing nations. For instance, advocates for the expansion of health and social services for the elderly face tough questioning from those responsible for national budgets, who must weigh many competing claims on scarce budgetary resources(Gibson, 1988). In the case of Malaysia, for instance, owing to the high cost of hospital use and technology in the care of an ever-increasing elderly population, the share of the total government medical expenditure in GNP increased from 1.51 percent in 1970 to 3.53 percent in 1980. As a result, the Malaysian government has recently started exploring the possibility of privatizing medical care services(Ogawa, 1985b). Similarly, the privatization of medical care services is one of the policy options being considered by the government of Thailand ; total government health care expenditures were 1.17 percent of GNP in 1979, growing to 1.43 percent in 1983 (Ogawa, Poapongsakorn and Mason, 1989). Depending upon policies to be adopted by these develo-

ping nations along the rim, further improvements of the health status of the elderly is likely to be seriously affected, which will, in turn, influence the future pattern of their labor supply.

Appendix Table 1. Means and Standard Deviations of Explanatory Variables Introduced into the Logit Regressions.

Explanatory Variables	Mean	Standard Deviation
Male	0.4168	0.4931
Age group		
60−64	0.3385	0.4733
65−69	0.2698	0.4439
70−74	0.1851	0.3884
Currently married(yes=1; no=0)	0.5649	0.4959
Buddhist(yes=1; no=0)	0.9078	0.2891
Educational attainment		
Grade 1−3	0.1210	0.3262
Grade 4	0.2281	0.4197
Grade 5 and over	0.0707	0.2564
Other education	0.0367	0.1880
Urban residence(urban=1; rural=0)	0.2554	0.4362
Number of consumer durable goods	3.9480	2.5071
Number of living children	4.8386	2.7169
Pension (main income source=1; otherwise=0)	0.0303	0.1716
Health status		
Healthy(yes=1; no=0)	0.6045	0.4890
Excellent(yes=1; no=0)	0.0407	0.1976
Good(yes=1; no=0)	0.3194	0.4663
Fair(yes=1; no=0)	0.2444	0.4298

N=2,999.

Appendix Table 2. Means and Standard Deviations of Explanatory Variables Introduced in Male and Female Participation Equations.

Esplanatory Variables	Male 1/		Female 2/	
	Mean	Standard Deviation	Mean	Standard Deviation
Age group				
60−64	0.3240	0.4682	0.3488	0.4767
65−69	0.2976	0.4574	0.2499	0.4331
70−74	0.1776	0.3823	0.1904	0.3927
Currently married(yes=1; no=0)	0.7936	0.4049	0.4014	0.4903
Buddhist(yes=1; no=0)	0.9016	0.2980	0.9125	0.2826
Educational attainment				
Grade 1−3	0.1592	0.3660	0.0938	0.2916
Grade 4	0.3096	0.4625	0.1698	0.3756

Grade 5 and over	0.1328	0.3395	0.0263	0.1601
Other education	0.0688	0.2532	0.0137	0.1164
Urban residence(urban=1 ; rural=0)	0.2456	0.4306	0.2624	0.4401
Number of consumer durable goods	4.0880	2.5010	3.8479	2.5074
Number of living children	5.1080	2.8291	4.6461	2.6177
Pension (main income source=1 ; otherwise=0)	0.0608	0.2391	0.0858	0.0922
Health status				
Healthy (yes=1 ; no=0)	0.6312	0.4827	0.5855	0.4928

1/ N=1,250.
2/ N=1,749.

Appendix Table 3. Means and Standard Deviations of Explanatory Variables Introduced into Participation Equation for South Korea.

Explanatory Variables	Mean	Standard Deviation
Age group		
60-64	0.3314	0.4714
65-69	0.2936	0.4516
70-74	0.2006	0.4010
Currently married (yes=1 ; no=0)	0.8808	0.3249
Buddhist (yes=1 ; no=0)	0.2791	0.4492
Education level		
Primary school	0.3081	0.4624
Middle school	0.0988	0.2989
High school and over	0.1686	0.3750
Urban residence (urban=1 ; rural=0)	0.6337	0.4825
Pension (main income source=1 ; otherwise=0)	0.0145	0.1199
Health status		
Healthy (yes=1 ; no=0)	0.6599	0.4744

N=344.

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《국문초록》

아태地域 老人의 勞動力參與에 관한 小考

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人口고령화에 따른 老人福祉問題는 先進國에서는 1950年代에 활발한 研究가 진행되었으나, 後進國은 폭발적인 人口增加問題에 직면 하여 汎世界的인 社會問題로 論難의 對象이 되지는 못하였다.

그후 4半世紀를 지난 1980年代에 이르러 開發途上國의 人口調節政策에 힘입어 出產率이 계속 變化하게 되었고 특히 東北 아세아 国家에서는 人口代置水準까지 이르게 되었다. 人口構造의 變化에 따라 불가피 하게 到來하는 人口의 고령화는 여러가지의 社會的인 問題를 자아내게 되며 社會福祉 施策에 対한 國民들의 욕구도가 점차로 강해지고 있다. 아·태지역, 開發途上國들의 人口轉換은 先進社會에 비하여 轉換의 程度가 가속화 되고 있으며 더욱이 期待되는 死亡水準의 改善이 상승 作用을 일으키게 될 것으로 예상되므로 더욱더 加速化될 전망이 높다고 하겠다.

또한 出產과 死亡水準의 變化와 더불어 都市化 및 產業化의 과정도 老人福祉에 영향을 미치게 된다.

經濟發展에 따른 都市化는 核家族化를 촉진시키게 되고 전통적인 家族制度를 維持할 수 없게되며, 젊은이들의 都市集中 傾向에 따라 敬老思想의 弱化와 더불어 地理的으로도 老人扶養에 対한 傳統的인 意識의 약화를 가져오게된다. 經濟發展과 人口變動은 人力需給의 측면에서도 검토 되어야 할 것으로 생각된다. 아·태지역국가들의 老人福祉制度는 아직도 초기단계이지만 전통적인 家族支援(Informal family supprot)으로부터 점차적인 公的支援(Formal support)이 뒷받침 되기 시작하고 있다.

아·태지역 開發途上國 老年人口는 1990年代에는 全體人口의 5~7%에 불가하지만 2020 年에는 10~15% 內外로 增加할 것으로 推定되고 있다.

最近 몇개 나라의 調査資料에 의하면 先進國에 비하여 老年人口의 經濟活動參與가 높은것으로 分析되고 있으며 또한 健康水準에 따라 差異를 보이기도 하지만 人口 資源의 活用側面에서 볼때 장기적인 勞動力 需給에있어 政策的인 配慮를 必要로 하는 部分이다. 또한 健康保險, 保健制度의 擴充 등 사회보장기능이 改善됨에 따라 노동력 참여율은 점차적으로 低下하게 될 것이지만 先進國水準에 달하기에는 많은 기간이 所要될 것으로 예상된다.

특히, 近來에 論議되고 있는 分野別 人力不足 현상을 감안할 때 加速的인 人口고령화에 따른 老年人力의 適切한 活用은 老年層이 감당할 수 있는 일, 또는 地域社會의 발전을 위하여 기여할 수 있는 일등의 개발로 정책적인 측면에서 배려 되는것이 바람직 하다.

文化的 背景을 달리하는 社會問題를 先進西方國으로부터 단순히 모방하는 오류를 범하지 않기 위해서는 우리들 나름대로의 獨自的인 研究開發이 절실히 要求되는 時期라고 하겠다.

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