Revista de Análisis Económico, Vol. 9, Nº 1, pp. 169-182 (Junio 1994)

FUNDED SOCIAL SECURITY SYSTEMS: A REVIEW OF ISSUES IN FOUR EAST ASIAN COUNTRIES*

FREDERICK RIBE**
International Monetary Fund April 1994

Abstract:

This paper reviews the structure and economic effects of the fully-funded centralized public pension programs in several East Asian countries. The major weaknesses of these programs are variable and often inadequate replacement rates as well as poor population coverage. Aside from encouraging development of financial markets, their chief virtue is their avoidance of economic distortions associated with the alternative pay-as-you-go approach. Growth-modeling exercises surveyed in the paper suggest that such distortions are the main way in which social security affects aggregate welfare in the long run. The paper therefore argues that expected pay-as-you-go based reforms should involve introduction of minimal flat-rate schemes as supplements to the existing systems.

Designing effective public pension systems has proved a difficult task. The defined-benefit approaches in use in most countries have proved costly and the wage taxes used to finance them distortionary and prone to evasion. While a defined-contribution model for provision of old-age and disability pensions can be expected to avoid these problems, it suffers from others that are at least equally severe, such as its failure to cover the entire population or to guarantee adequate benefits to participants. Partly for these reasons, pure defined-contribution systems are comparatively rare.

* Paper Prepared for Delivery to the Rio Conference on Pension Systems and Reform July 28-29, 1994.
** The views expressed in this paper are those of the author alone and do not necessarily reflect positions of the International Monetary Fund. For comments on earlier drafts, the author thanks Juan Amieva, Sheetal Chand, Robert Hagemann, Aasim Husain, Lazarus Molho, David Ordoobadi, Klaus Schmidt-Hebbel, Parthasarathi Shome, and an anonymous referee. None is responsible for errors that remain.

East Asia, however, provides a rich body of experience with defined-contribution systems, as several countries there have used one variant of that approach, the provident fund, for several decades. East Asian countries using that model have divergent levels of per-capita income and formal sectors that account for widely different shares of the overall economy. Their formal social security programs vary widely in scope, and, partly as a result of variations in the domain of the formal sector of the economy, in coverage.

This paper surveys experience in three such countries, Indonesia, Malaysia, and Singapore, in an effort to glean insights regarding the effectiveness of defined-contribution systems in solving contemporary problems in designing public pension programs. The paper also surveys arrangements in one other East Asian country, Thailand, that as yet has few formal social security institutions but is actively considering their introduction. The first section provides a factual overview of the formal social security arrangements in these countries. (A similar overview of non-pension social insurance programs is given in the Appendix.) The second section focuses on the policy issues that have arisen in connection with the provident funds in these countries. It explores the programs' coverage of the overall populations, the adequacy of the programs' benefits to participants, the institutional issues concerning program management and supervision that they raise, and their impacts on the development of capital markets, the allocation of capital, the overall fiscal balance, labor markets, national saving and the overall economy. On the basis of this discussion, a final section draws lessons from experience in East Asia, both for further reforms in those countries and for application elsewhere.

1. Formal social security arrangements[1]

a. *Old-age pension systems*. Superannuation pensions in Indonesia, Malaysia, and Singapore rely heavily on provident funds-fully funded defined-contribution schemes that are compulsory within most of the formal sector. Compulsory contributions are assessed on both employer and employee. Contributions are maintained in a central fund under the control of program administrators, and separate accounts are maintained for individual contributors. Accounts are portable as long as the contributor remains within the covered sector; upon reaching age of eligibility, benefits consist of accumulated contributions plus interest.

In evaluating these programs, it is useful to bear in mind the ways in which they differ from the systems that are in use elsewhere in the world. A close relative of the provident-fund approach is the compulsory defined-contribution *decentralized* scheme that is in use in Chile and other countries. Under this approach, benefits also represent accumulated contributions (which are compulsory) plus interest, but investment of account balances is managed by a private-sector entity chosen by the account holder. Typically portfolio holdings are more varied, as are the supervisory and regulatory issues posed for the authorities.

A second alternative approach to which the provident fund model must be compared is the defined-benefit pay-as-you-go (PAYG) approach that is widely used elsewhere in the world. Under this model, benefits are defined by law, and those to which a given beneficiary is entitled bear no strict relation to his or her contribution history. As a result, such programs entail a considerable element of transfer between contributors and beneficiaries, and among beneficiaries. This method represents a "social contract" committing the earning population to the support of retirees.

Malaysia (through the Employees Provident Fund) and Singapore (the Central Provident Fund) maintain provident funds for wage earners in both the private and public sectors. Indonesia (through ASTEK) applies this model to the private sector and apparently intends that the same approach will apply to public-sector workers in the future. Thailand enacted a public-pension program along provident fund lines in 1956, but never implemented it, and even now has no significant public pension scheme for private-sector workers. Occupational privately managed provident funds are well established, however, and are supported by tax preferences[2].

Within the basic provident fund model, however, the schemes in the East Asian countries embody several structural variations regarding the contribution rate, the liquidity of account balances, and the form in which withdrawals can ultimately be made. Combined contribution rates vary from 2.5 percent of wages in Indonesia to 22 percent in Malaysia (12 percent and 10 percent on employers and employees, respectively) and 40 percent (18.5 percent on employers and 21.5 percent on employees) in Singapore[3]. Accumulated deposits are quite illiquid except in Malaysia, which permits early withdrawal of a third of the account balance in lump-sum form at age 50, and a withdrawal of up to 45 percent at any age to finance purchase or construction of low-cost housing. In Singapore, withdrawals to finance purchases of housing have long been permitted and have been a major factor in financing mass housing. More recently, terms have been liberalized to allow investment in trustee stocks, gold, shares in the Singapore Bus Service, nonresidential property, education, insurance, and other assets.

Benefits take the form of a lump-sum payment upon retirement in all three countries. Singapore, however, applies part of the accumulated contributions to the financing of health benefits through the Medisave program before and after retirement, and holds back a share upon retirement to finance an annuity under the Minimum Sum scheme.

The main departure from the defined-contribution model among these countries occurs in Indonesia's and Thailand's pension programs for public-sector employees. While some language pertaining to the provident fund structure is present in the statutes in Indonesia, civilian and military workers (under TASPEN and ASABRI, respectively) are provided with defined-benefit pensions. These embody relatively high replacement rates (estimated at 80 percent) based on the last month's salary and eligibility for full benefits at age 55. Thailand's system is similar, with an estimated replacement rate of 70 percent and retirement age of 60.

b. *Disability and survivors' pensions*. The provident fund approach is also used in Indonesia and Singapore to provide disability and survivors' benefits. In Thailand and Malaysia, by contrast, defined-benefit schemes are used. Under the provident-fund approach in the former two countries, benefits are provided through a lump-sum distribution of accumulated contributions and interest. In Indonesia, an additional fixed payment is made to heirs and is financed by an 0.5 percent levy on employers. In Singapore, the lump-sum distribution is subject to set-asides for medical care and a basic annuity as described above.

2. Issues in the use of provident funds as vehicles for provision of public pensions

a. *Poor population coverage*. A major problem facing social security in the East Asian countries employing provident funds is the incompleteness of the funds'

coverage of the relevant populations. Only in Singapore, due to its highly urbanized structure, is coverage extensive (estimated recently at 78 percent of the total population). Mesa-Lago (1992) estimates that roughly 12 percent of the population is covered in Indonesia and 34 percent in Malaysia; estimates by Dixon (1989) are even lower.

One important source of the incompleteness of coverage lies in formal eligibility criteria. Compulsory coverage under most programs is restricted to wage earners in the formal sector. Specific provisions frequently exclude the self-employed, domestics, and, in some countries, such occupational groups as fishermen and agricultural workers.

Administrative and geographic factors also help account for limited population coverage. In several programs and countries, the exemption of employees of small establishments for administrative reasons significantly reduces coverage, as small enterprises account for a significant share of employment (Tyabji, 1993). Thus, Malaysia applies disability and work-injury protection to those with five workers or more; and Thailand applies most programs to establishments with 10 workers or more. In addition, coverage is reduced by geographic dispersion, particularly in Indonesia; by the lack of awareness of the programs among potential beneficiaries; and by resistance among employers (Tyabji, 1993).

The incompleteness of population coverage by formal social security institutions has historically been offset by the traditional modes of social support. In all of the countries under consideration, significant transfers among households have traditionally occurred on the basis of solidarity within extended families, or ties among members of given localities or religions (Tyabji, 1993). Correspondingly, popular attitudes are opposed to formal programs to accomplish the social assistance function of social security in most of the countries concerned.

Still, industrialization and urbanization clearly represent a challenge to the combination of formal social security arrangements in the formal sector and traditional social support mechanisms elsewhere. The effectiveness of family-based systems of support for the elderly is declining (Tyabji, 1993), constituting one impetus for the implementation of formal social security in Thailand and for the extension of coverage in Indonesia and other countries.

b. *Ineffective protection*. More importantly still, a progressive breakdown in traditional arrangements in Indonesia and other countries has also raised concerns about the effectiveness of the defined-contribution model in providing old-age security even for those who are covered by the formal program. Formal social security arrangements in these countries have long been widely criticized in the literature for their ineffective protection of the insured (*e.g.*, in Dixon, 1989). A variety of essential attributes of defined-contribution systems contributes to this problem: the vulnerability of contributors at low wage levels or with short employment histories (reflected, for example, in a consistently low level of per-capita deposits noted by Dixon); the unevenness of beneficiaries' attachment to the labor force; the predominance of lump-sum distributions as means of distributing benefits, which make benefits vulnerable to myopic decisions on the part of newly retired beneficiaries; the poor investment policies of some provident funds (a problem that is discussed below); and, as Dixon (1989) and Lim *et al.* (1986) emphasize, the fact that provident funds in several of these countries serve other objectives beyond replacement of income. In particular, their role in financing acquisition of housing (especially in Singapore) and in financing health care (again especially in Singapore), reduces the effectiveness of provident funds in providing income support to the aged and disabled.

Some evidence in support of the conclusion that protection is poor can be gleaned from Table 1, which shows figures on per-capita benefits across countries, expressed in U.S. dollars, as well as growth rates of real benefits per member of the total population, expressed in units of national currency. Of course, inferences about benefits under old-age and disability programs financed on a strict defined-contribution basis cannot be drawn directly because the figures for all countries include benefits for programs, such as health care, that are financed on a different basis. Moreover, the figures on benefits in dollar terms reflect a number of factors, such as the sizes of the uncovered population, especially in Indonesia and Thailand, and of the contribution rate, especially in Thailand, in addition to the variable in question, the replacement rate. Moreover, the figures cover a period during which virtually all the East Asian countries were in the grip of a severe recession. Still, the figures are suggestive. In particular, the variance of the growth rate of real benefits for the three provident-fund countries is clearly higher than for others.

Another source of potentially poor coverage by defined-contribution pension programs is the fact that the replacement rate is by definition not fixed. As Vittas

TABLE 1

PER-CAPITA SOCIAL SECURITY
BENEFITS IN VARIOUS COUNTRIES, 1983-86

	1983	1984	1985	1986
		(Levels in U.S. dollars per recipient)		
Indonesia	0.03	0.03	0.04	0.04
Malaysia	34.58	36.70	37.88	35.60
Singapore	343.77	656.13	651.24	715.29
Thailand	1.39	0.18	0.17	0.16
****				
Brazil	49.21	42.85	44.64	82.14
Chile	197.61	165.84	141.85	154.98
Japan	1132.20	1093.98	1446.86	1965.08
United States	1843.61	1876.20	1990.51	2088.06
		(Annual growth of real per-capita benefits in units of national currency)		
Indonesia		11.47	24.24	34.63
Malaysia		5.69	2.24	0.88
Singapore		90.11	–4.05	14.46
Thailand		110.11	–10.16	–8.93
****				
Brazil		–5.10	5.38	6.12
Chile		2.80	–5.45	1.92
Japan		2.59	2.52	8.20
United States		–2.73	1.87	3.67

Source: International Labor Office, "The Cost of Social. Security: Thirteenth International Inquiry, 1984-86" (Geneva, 1992).

(1993) has pointed out, the replacement rate of such programs varies positively with the interest rate paid on assets and negatively with the growth rate of wages. This makes the degree of social protection hostage in part to the macroeconomic fortunes (and management) of the country concerned.

The importance of these factors can be illustrated easily through simulations based on recent experience with rates of interest and wage growth in various countries. In order to highlight the dependence of the replacement rate on economic conditions, I have calculated hypothetical replacement rates based on recent experience in the East Asian countries as well as in one other-Chile-with a formally similar public pension program but a different profile of rates of interest and wage growth. In each calculation, I assume that a retiree works from age 20 until various alternative retirement ages have been reached. During the intervening period, wage rates are assumed to grow at the average real growth rate experienced over the period 1980-90 (Table 2), while contributions earn interest at the average real yield on deposits experienced over the same period (also shown in Table 2).

TABLE 2

AVERAGE VALUES OVER 1980-1990 PERIOD
FOR GROWTH IN LABOR MARKET CONDITIONS
AND FOR REAL INTEREST RATES
(Annual rates in percent)

	Manufacturing Employment	Real Earnings in Manufacturing	Real Interest Rate on 6-Month Time Deposits
Brazil	–0.55	1.00	7.34
Chile	2.49	1.51	8.34
Indonesia	9.95	6.46	7.91
Japan	0.58	1.60	4.20
Malaysia	5.91	2.72	3.23
Singapore	2.43	5.74	3.87
Thailand	4.61	3.89	6.35
U.S.	–1.06	–0.10	3.40

Sources: International Monetary Fund, *IFS* and WEO databases; and World Bank, *World Tables*, various issues.

The wage rate in the year of retirement is normalized at unity. Denoting the statutory contribution rate as $\underline{c}$, the interest rate as $\underline{r}$, the growth rate of the wage rate as $\underline{g}$, then accumulated contributions at the time of retirement after working N years are given by

$$A = c\sum_{t=1}^{N} [(1 + r) / (1 + g)]^{t}. \quad (1)$$

Upon reaching the assumed statutory age of eligibility, each retiree is assumed to draw benefits in the form of an annuity over his remaining expected life, with payments determined by the interest rates shown in Table 2. Life expectancy is assumed to equal that estimated for each country at birth[4]. The replacement rate is then given by the ratio of the annuity to the wage received immediately before retirement[5].

The resulting estimated replacement rates for alternative statutory ages of eligibility for benefits in three countries are shown in Table 3. The striking difference is of course the generous accumulation of benefits that is projected using Chilean data from the significant differential between the interest rate, on the one hand, and the growth rate of the wage on the other. Choice of later and later eligibility for benefits raises the replacement rate both by increasing accumulated contributions plus interest faster than the wage grows, and by increasing the annuity payment through a reduction in the number of years over which payments exhausting a given fund are to be made.

TABLE 3

REPLACEMENT RATES OF DEFINED-CONTRIBUTION
PENSION SCHEMES AT VARIOUS ASSUMED RETIREMENT AGES

	55	60	65	70
Chile	1.1719	1.6707	2.3614	3.3178
Malaysia	0.2974	0.3431	0.3898	0.4377
Singapore	0.4136	0.4528	0.4886	0.5214

Source: Calculations described in text.

If the figures based on Chilean data suggest an overly generous replacement rate, those based on figures for Malaysia and Singapore suggest a potentially insufficient one, especially when it is borne in mind that many beneficiaries have shorter contribution histories than those assumed in this exercise. Even when eligibility is extremely delayed-to 70 years-replacement rates are relatively modest, at or below 50 percent. In the case of the calculation using Malaysian figures, a moderately high differential between the interest rate and the growth rate of wages, relative to the calculation based on trends for Singapore, is offset by a lower assumed contribution rate.

c. *Investment policies and their fiscal implications*. The funds in the East Asian countries in question invest predominantly in only two assets: government bonds, and deposits, typically (as in Singapore) advance deposits at the central bank in anticipation of investment in government paper (Asher, 1985; Shome and Saito, 1979; Shome, 1986; International Labour Organization, 1987; Mesa-Lago, 1992). These investment policies raise a number of issues which are taken up in this and the following subsections.

The first issue to be considered here is whether the funds' policies of investing in government securities worsen the overall fiscal position of the countries concerned. It is often alleged that investment of social security surpluses in government debt tends to "mask" the size of the deficit in the rest of the government's accounts, thereby minimizing the fiscal discipline that financial markets and the political process are able to enforce[6].

The force of this argument is reduced, however, by the fact that, if it is reported correctly, the size of the general government deficit should be invariant to the particular mix of financing instruments chosen by components of the total[7]. Leaving this issue aside, governments that wish to avoid the appearance of exploiting the financing offered by social security attempt to maximize political and market discipline by publishing prominently the respective sizes of the social security surplus and the imbalance in remaining government accounts. Another possible solution that takes this logic further is for the government to announce a fiscal targeting strategy that is itself unaffected by the social security surplus-such as a strategy of targeting a given rate of growth in non-social security expenditures.

A related issue is whether the provident funds' investment policies increase the deficit by giving the fiscal authorities a captive low-cost source of financing of fiscal deficits, as is alleged with respect to many parts of the developing world. The force of this argument is somewhat blunted for the East Asian countries since the rate of return on fund balances has been relatively high[8]. Estimates for particular years during the early 1980s (Shome, 1985) and mid-1980s or early 1990s (Mesa-Lago, 1992) suggest that the return to the provident fund portfolio has been positive in real terms in Singapore, Malaysia, and Indonesia. That is consistent with evidence on the overall level of real (short-term) interest rates in these and other countries during the 1980s, as is shown in Table 2. The table shows real rates on 6-month time deposits for lack of consistent data on other instruments.

d. *Impacts on development of capital markets and on the allocation of capital.* Proponents of the funded social security systems in the countries under discussion contend that they encourage the development of financial markets. By mobilizing large amounts of funds and channeling them into longer-term assets than typically occupy the portfolios of other financial intermediaries, provident funds are viewed as having the potential to foster the development of private capital markets, and forms of real investment dependent on stable sources of financing. While the funds are concentrated in government bonds, derivative benefits may be produced for markets for debt issued by other borrowers, as such markets no doubt develop as diversified versions of the original market for treasury debt. Nevertheless, the development of private capital markets would undoubtedly be stimulated further through a more diversified investment policy on the part of the funds. This possibility is discussed below.

Provident funds are sometimes criticized for biasing the allocation of capital as a result of their investment decisions. Because they invest primarily in government paper, the funds in East Asia are not directly guilty of this charge. The argument applies indirectly in Malaysia and Singapore, however, as a result of the selective purposes for which account-holders have been allowed to withdraw their balances. Above all, the argument applies to housing investments in both countries, which has led some analysts (*e.g.*, Lim *et al.*, 1986) to conclude that these countries have overinvested in housing at the expense of other components of the capital stock.

e. *Adequacy of rate of return.* Perhaps the most important issue associated with the provident funds' investment policies is their implications for the rate of return paid to deposit holders. From a fiduciary point of view, fund managers can be argued to have an obligation to maximize this return. From a social policy point of view, moreover, the concerns discussed above having to do with the inadequacy of the replacement rate for many beneficiaries also suggest that maximizing the rate of return is a matter of urgency.

The obvious way of increasing portfolio returns is to diversify into alternative assets, such as bonds and equities issued by private concerns. Most estimates suggest that such a policy offers an expected return over long periods that is significantly higher than those offered on government securities alone. Risk, meanwhile, can be managed through diversification. Beyond offering the promise of greater returns, of course, such a policy would more directly stimulate the development of private capital markets than does the present approach.

To be sure, a more diversified investment policy would involve a heavier supervisory burden. If a diversified approach were followed within the current centralized framework, measures would be needed to avoid corruption, minimize operating costs, and avoid the acquisition of controlling interests in individual enterprises, with its attendant risk of "pension fund socialism" in an era of privatization. The government could also face demands for explicit insurance of portfolio holdings against default. Mechanisms to provide supervision to provident funds include the appointment of outside trustees, development of investment guidelines, publication of complete data on investment returns and operating costs, and regular scrutiny by outside auditors.

f. *Impacts on voluntary saving.* One of the major virtues often attributed to the provident funds in the countries under study is the generation of additional saving. Whether the funds do so to a significant extent is much debated. There are good theoretical reasons to assume that discretionary household saving by lifecycle savers without liquidity constraints might fall virtually unit for unit with rises in balances under such compulsory saving schemes (Shome and Squire, 1980), as long as the latter are fully liquid. With the exception of the Singapore Central Provident Fund in recent years, however, the liquidity of compulsory fund balances in the countries under study is typically quite low, which suggests that the impact on saving remains an open question even if the lifecycle model applies.

A significant volume of empirical work on the issue of impacts on voluntary saving in these countries has not reached an unambiguous conclusion as yet (Tyabji, 1993 and Chandavarkar, 1993 provide good recent surveys). Shome and Saito's (1979) and Datta and Shome's (1981) work for a number of Asian countries, perhaps the most widely cited studies, focus on the opposing impacts of substitution and forced saving effects; they conclude that provident fund saving may have increased overall saving in Malaysia and Singapore, where the relative illiquidity of contractual saving over much of the sample period suggests that substitutability was arguably low.

g. *Impacts on labor markets.* Labor market effects constitute the strong suit of defined-contribution pension schemes such as the provident funds under discussion here. Because of the inextricable link that is created between contributions and benefits, contributions under such programs can lose the distorting characteristics of taxes (as long as contributions do not exceed desired voluntary saving). This can significantly increase overall economic efficiency relative to the alternative of PAYG, in part because evasion is reduced (Auerbach and Kotlikoff, 1987). Because the East Asian countries rely heavily on defined-contribution schemes (or in the case of Thailand, on no scheme at all thus far), there is little evidence of concern over labor-market impacts in the literature. Of course, labor market issues should be the focus of discussion of any proposals for changes in social security institutions.

h. *Overall impacts on growth.* As yet there has been little study of overall economic impacts of social security arrangements in East Asia[9]. Some inferences can be drawn, however, from the literature on saving and labor-market impacts, discussed above, and that on economic growth in the abstract.

There is some basis for arguing that the level of the growth path for a given country is increased to the extent that its social security arrangements increase the overall saving rate. For *de novo* introduction of a defined-contribution program where before there was none, for example, there is evidence suggesting that the level of output should rise at least slightly in the long run if the program leads to a net increase in saving, and if the coverage of the program is large enough to make a difference to the overall saving rate.

From a purely empirical point of view, for example, Otani and Villanueva (1988) have developed estimates of factors associated with the growth of real GDP per capita in a sample of developing countries at varying income levels. For relatively high-income countries such as Malaysia and Singapore, the results suggest that the growth rate increases by 0.15 percentage point for every percentage point by which the ratio of gross domestic saving to GNP increases. The coefficient for low-income countries such as Indonesia and Thailand, however, is much lower –0.003 percentage point per point increase in the saving ratio[10].

The theoretical literature provides richer results for instances in which the change in social security arrangements involves either institution of a PAYG program *de novo* –an issue of some potential relevance in Thailand– or substitution of PAYG for a fully funded system, which may be relevant to Indonesia. Chiefly because of the distortions of both labor and saving decisions, institution of PAYG *de novo* in an economy with a growing population such as the United States has been shown to reduce income and welfare significantly (Auerbach and Kotlikoff, 1987) in the context of a lifecycle-based exogenous-growth model. Other analysts using exogenous growth models have found that replacing PAYG with a funded system can increase output and welfare slightly as long as the outstanding implicit debt to those effectively vested under PAYG is retired through taxation rather than borrowing (Corsetti and Schmidt-Hebbel, 1994). The effects are potentially stronger in two-sector endogenous growth models that account for the presence of an illicit tax-sheltered sector facilitating tax evasion under PAYG. One study using such an approach imputes significant reductions not only in levels of output but in growth rates to a shift from full funding to PAYG. This result is chiefly due to the increases in distortions under PAYG (Corsetti and Schmidt-Hebbel, 1994).

3. Conclusions

The experience and theoretical research surveyed in this paper re-emphasize the earlier supposition that the chief strength of defined-contribution pension programs is their avoidance of the distortionary effects of the wage taxes associated with PAYG systems. Indeed, the main surprise contained in the paper is perhaps the suggestion from various models of economic growth that the avoidance of those distortions appears to exert a stronger influence on output and potentially on growth than do these programs' impacts on saving. In most countries surveyed, evidence of positive impacts on saving is thin; even if it were not, growth-modeling exercises do not suggest that there can be a major impact on the path of output due to saving impacts alone.

The undoubted role of funded pension programs in promoting the development of domestic financial markets, however, somewhat bolsters the importance attached to the programs' mobilization of significant volumes of funds. While this advantage is undercut in some countries by the fact that governments can easily misuse these funds as a captive source of financing for unduly large fiscal deficits, this does not appear to

have occurred in the East Asian countries discussed in this paper. Nevertheless, as a step to make such abuse still less likely as well as to stimulate further development in private financial markets and to raise the replacement rate-a critical issue-it would seem desirable for the East Asian countries to consider the option of diversifying portfolios into private-sector assets.

The chief drawback of formal social security in East Asia has been its failure to cover the population adequately: except in the unusual circumstances of Singapore, the plans surveyed in this paper have covered disappointingly small fractions of the population. This shortcoming, however, primarily reflects geography and the structure of the economies concerned rather than the nature of social security itself. The degree of geographic dispersion in Malaysia and Indonesia represents an unusually stiff administrative challenge to any government program with a mass constituency. The importance of agriculture and the size of the informal sectors in the East Asian economies have also been obstacles to the widespread application of formal social security.

Apart from poor coverage, the inadequate replacement rates of the East Asian plans for many recipients have been a source of criticism, and have lent force to proposals for programs, such as PAYG plans, that offer more effective income security to beneficiaries. In view of the significant inefficiency attaching to such plans, however, it is to be hoped that a restructuring of social security in any of the East Asian countries might take place through supplementation, rather than replacement, of the existing defined-contribution approach with a defined-benefit plan. This concern is particularly compelling in light of the increases in old-age dependency that are currently projected for the economies under discussion over the next several decades (Table 4). The inefficiency of a PAYG plan in the context of these demographic changes in the countries concerned is likely to be at least as problematic as it is proving in other countries, including those in the OECD (Hagemann and Nicoletti, 1989). In light of these issues, there is undoubted appeal to a combination of a defined-benefit program offering minimal benefits, supplemented by a defined-contribution program. Whether the latter should follow the centralized model of the present East Asian programs or should instead emulate these programs' decentralized cousins in Chile and elsewhere remains an open question. It must necessarily be the subject of another paper.

Overview of Formal Social Insurance Programs in *Indonesia, Malaysia, Singapore, and Thailand*

1. *Workmen's compensation.* All four countries provide protection to workers for work-related accidents or death. The predominant pattern (Indonesia, Singapore, and Thailand) is through imputation to the employer of liability for medical costs, replacement of a share of earnings, and survivors' benefits. Indonesia supplements this approach with a social insurance system financed by employers' payroll contributions, while Malaysia offers the social insurance approach only.

2. *Unemployment compensation.* Benefits for the unemployed are effectively unknown among these countries: only Thailand has legislation establishing a system of unemployment insurance, and even this system may not be implemented. Under the Social Security Act of 1990 this system is to be implemented by 1996, financed by payroll contributions. As in the case of the old-age pension system, the details of the structure of this program have yet to be determined.

TABLE 4

DEMOGRAPHIC DEPENDENCY RATIOS FOR RETIREMENT AT AGE 55
(RATIO OF POPULATION AGED 55 OR OLDER TO POPULATION AGED 15-54)

	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2050	2075	2100	2125	2150	2175	2200	2225	2250
Brazil	18.1	18.2	18.5	20.1	22.9	26.9	31.9	36.1	40.2	45.0	58.8	66.9	71.9	75.9	77.7	66.9	71.9	75.9	77.7
Chile	21.4	21.9	23.2	25.0	28.0	32.6	38.5	43.6	47.4	49.9	64.0	71.1	74.6	77.3	78.5	71.1	74.6	77.3	78.5
Indonesia	16.9	17.4	17.8	18.2	20.2	22.9	26.5	29.6	33.8	39.0	50.9	60.3	67.7	73.4	76.2	60.3	67.7	73.4	76.2
Japan	40.6	46.1	53.6	64.8	72.1	74.9	78.3	83.3	91.3	95.1	90.5	79.5	78.4	79.2	79.6	79.5	78.4	79.2	79.6
Malaysia	15.3	16.4	16.7	18.0	20.1	23.0	26.5	29.9	33.6	36.3	54.1	70.0	74.4	77.2	78.5	70.0	74.4	77.2	78.5
Singapore	19.2	21.7	23.5	29.1	36.6	46.8	57.1	64.1	69.6	70.9	75.1	74.3	76.1	78.1	79.0	74.3	76.1	78.1	79.0
Thailand	15.5	16.6	17.3	19.0	22.0	26.2	31.2	37.5	43.5	49.0	58.6	68.8	73.7	76.8	78.3	68.8	73.7	76.8	78.3
U.S.	36.7	35.7	36.6	40.5	45.8	52.8	59.7	64.3	66.9	67.5	70.2	74.3	76.7	78.4	79.2	74.3	76.7	78.4	79.2

Source: World Bank.

3. *Health benefits.* Approaches to provision of health benefits vary. Indonesia and Thailand provide separate payroll-based health insurance programs for wage earners, while Singapore's system is subsumed under the Central Provident Fund, as described above. Malaysia provides universal health care financed outside the social security system.

Indonesia provides benefits to workers and dependents covered under voluntary employer-financed health insurance schemes, with financing provided by a 7 percent payroll tax. Thailand's system is similar, though financing is provided by equal wage or payroll-based contributions by employers, workers and government. Benefits are limited to workers and maternity benefits for wives. In Singapore, a share of employers' and workers' contributions under the provident fund is set aside to cover medical care for workers and dependents before and after retirement under the Medisave provision.

4. *Family and maternity benefits.* Only Thailand has or proposes a system of cash family benefits under social security, to be implemented in 1996 under the 1990 Act. Similarly, only Thailand provides paid maternity leave for covered workers under social security. Indonesia, Singapore, and Thailand provide maternity care under terms identical to those governing health insurance for covered wage earners, while Malaysia provides maternity care outside the social security system.

Notes

1 The factual material presented in this section is based primarily on United States Social Security Administration (1991). In addition, it draws on Dixon (1989), Hirtz (1992), Queisser (1991), Tyabji (1993), and on unpublished International Monetary Fund sources.

2 Through the Social Security Act of 1990, Thailand mandated that a compulsory public pension program would be implemented beginning in 1996, but the nature of this system has not yet been determined.

3 The rate structures that apply to both employees and employers in Singapore are subject to a ceiling of S$ 6,000 monthly.

4 For Chile, 72 years; for Malaysia, 71 years; for Singapore, 74 years (estimates as of 1990). Source: World Bank.

5 The annuity is calculated using a standard financial table based on three parameters: the accumulated asset value given by equation (1), the interest rate from the country concerned (drawn from Table 2), and the term of the annuity (given by the difference between the assumed age of retirement and life expectancy at birth). In practice, interest rates may be lower to compensate the vendor of the annuity for various risks. This factor has not been taken into account in the figures shown.

6 For one example of such reasoning, see *The Economist* (April 8, 1989). For a survey of recent issues related to market-based fiscal discipline, see Lane (1993).

7 In particular, the size of the deficit should be unaffected by the decision to invest the social security surplus in non-government assets as opposed to government debt. Instead, this decision should merely affect the composition of the financing that is recorded for an unchanged overall deficit. The general government balance is the consolidated balance of the central and local governments and of the social security funds.

8 In countries with a well -developed market for government debt, a solution to this problem is typically found by issuing nonmarketable securities to social security with a yield related by statute to those on marketable government debt.

9 Queisser (1991) points out correctly that the programs in some countries, perhaps especially Indonesia, are too small in relation to the overall economy to make a difference. She also addresses short-term economic impacts from a Keynesian perspective.

10 Recent theoretical papers, however, cast doubt on the magnitude of the growth impact that Otani and Villanueva postulate and call into question the notion that causality between saving and growth runs in the conventional direction as postulated by Otani and Villanueva (King and Levine, 1994; Carroll and Weil, 1993).

References

"AMERICAN SURVEY: The Folly of Raiding the Piggy-Bank", *The Economist* (April 8, 1989), pp. 49-50.

ASHER, MUKUL G., *Forced Saving to Finance Merit Goods: An Economic Analysis of the Central Provident Fund*, Occasional Paper, Nº 36. Centre for Research on Federal Financial Relations, The Australian National University (Canberra, Australia, 1985).

AUERBACH, ALAN J. and LAURENCE J. KOTLIKOFF, *Dynamic Fiscal Policy* (Cambridge: Cambridge University Press, 1987).

CARROLL, CHRISTOPHER D. and DAVID N. WEIL, "Saving and Growth: A Reinterpretation", Working Paper Series, National Bureau of Economic Research, Inc., Working Paper Nº 4470 (Cambridge, September 1993).

CHANDAVARKAR, ANAND, "Saving Behaviour in the Asian-Pacific Region", *Asian-Pacific Economic Literature*, Vol. 7 (Nº 1, May 1993), pp. 9-27.

CORSETTI, GIANCARLO and KLAUS SCHMIDT-HEBBEL, "Pension Reform and Growth", Draft prepared for the Conference on "Pensions: Funding, Privatization and Macroeconomic Policy", Catholic University of Chile, Santiago, January 26-27, 1994.

DATTA, GAUTAM and PARTHASARATHI SHOME, "Social Security and Household Savings: Asian Experience", *The Journal of Institute of Developing Economies*, Vol. 19 (Nº 2, June 1981).

DIXON, JOHN, "A Comparative Study on Provident Funds: Their Present and Future Explored", *Journal of International and Comparative Social Welfare*, Vol. 5 (Nº 2, November 1989), pp. 1-28.

INTERNATIONAL LABOUR OFFICE, *The Cost of Social Security, Thirteenth International Inquiry, 1984-1986* (Geneva: International Labour Office, 1992).

INTERNATIONAL LABOUR OFFICE, *L'Investissement des Fonds de la Securite Sociale dans les Pays en Developpement* (Geneva: International Labour Office, 1987).

HAGEMANN, ROBERT P. and GIUSEPPE NICOLETTI, "Population Ageing: Economic Effects and Some Policy Implications for Financing Public Pensions", *OECD Economic Studies* (Nº 12, 1989).

HIRTZ, F., "Formal Social Security in Selected Asian Countries", in Getubig and Schmidt (eds.), *Rethinking Social Security; Reaching Out to the Poor* (Kuala Lumpur, Malaysia: Asian and Pacific Development Centre, 1992).

KING, ROBERT G. and ROSS LEVINE, "Capital Fundamentalism, Economic Development, and Economic Growth", International Bank for Reconstruction and Development, mimeo (February 1994).

LANE, TIMOTHY, "Market Discipline", International Monetary Fund *Staff Papers*, Vol. 40 (March 1993), pp. 53-88.

LIM, C.Y. *et al.*, "Report of the Central Provident Fund Study Group", *Singapore Economic Review*, Vol. 31 (April 1986).

MESA-LAGO, CARMELO, "Comparative Analysis of Asia and Latin American Social Security Systems" in Getubig and Schmidt (eds.), *Rethinking Social Security; Reaching out to the Poor* (Kuala Lumpur, Malaysia: Asian and Pacific Development Centre, 1992).

OTANI, ICHIRO and DELANO VILLANUEVA, "Determinants of Long-Term Growth Performance in Developing Countries", *IMF Working Paper*, International Monetary Fund (Washington, D.C.), WP/88/97 (November 1988).

QUEISSER, MONIKA, "Social Security Systems in South-East Asia", *International Social Security Review*, Worldview, Vol. 44 (January-February 1991), pp. 121-134.

SHOME, PARTHASARATHI, *Fiscal Issues in South-East Asia* (New York: Oxford University Press, 1986).

SHOME, PARTHASARATHI and LYN SQUIRE, "Alternative Mechanisms for Financing Social Security", *World Bank Staff Working Papers*, The World Bank (Washington, D.C., U.S.A.) (Number 625, 1983).

SHOME, PARTHASARATHI and KATRINE A. SAITO, *Social Security Institutions and Capital Creation: Singapore, the Philippines, Malaysia, India and Sri Lanka*, Sritua Arief and Associates (Kuala Lumpur, 1979).

TYABJI, AMINA, "Social Security in the Asian-Pacific Region", *Asian-Pacific Economic Literature*, Vol. 7 (Nº 1, May 1993), pp. 53-72.

UNITED STATES SOCIAL SECURITY ADMINISTRATION, *Social Security Programs Throughout the World-1989* (Washington, D.C., 1990).

VITTAS, DIMITRI, "The Simple(r) Algebra of Pension Plans" (Financial Sector Department, World Bank, Washington, D.C., 1993).