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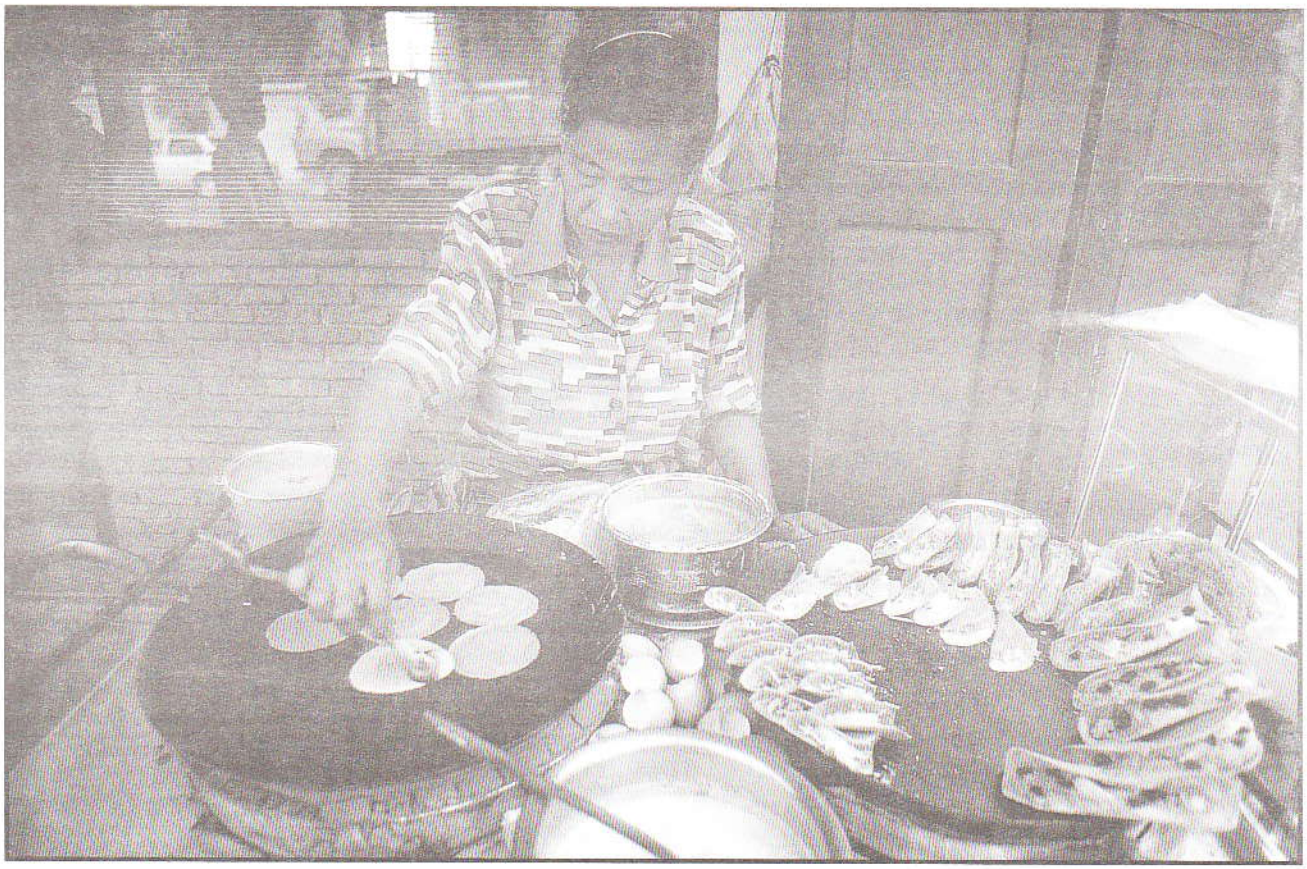

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Options for Extending the Coverage of Social Security to the Self-employed*

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INTRODUCTION

The extension of social security so that it covers the self-employed must be considered within the context of the existing system. Relevant issues include: the manner and the extent by which the self-employed are covered under the existing system, whether or not the extension of coverage should be mandatory or voluntary, how participation is to be enforced if the mandatory option is chosen, and should voluntary participation be chosen what measures should be taken to reduce adverse selection. But for either approach, a decision must be made on the benefits to be covered. Should contributions be related to risk or ability to pay? What conditions or restrictions should be imposed on the claiming of benefits in order to reduce the incidence of moral hazard?

This article will first discuss some opinions and pros and cons of some options related to these issues; afterward, steps and options to extend coverage to the self-employed will be proposed.

SOME THOUGHTS ON THESE ISSUES

When designing a social security system, there exists a problem regarding the level of living standard which is to be maintained: should it be the minimal essential level for personal maintenance, or a normal or average living standard? To most public policy makers, governments are mandated only to protect their citizen from falling below a minimal level. Individuals aspiring to higher living standards should take it upon themselves to realize and maintain them. However, in practice, it is difficult to define a minimal essential living standard which is acceptable to all, since opinions on the subject vary from one individual to another. Hence, any scheme which provides for a uniform level of protection cannot be attractive to all; some would even prefer to opt out of the scheme and live without protection of this sort.

Although, on average, self-employed workers belong to the low income class, a great deal of variation within this group exists.

However, if different schemes are available, persons with different needs and preference will be able to choose from those options best suited to their needs. Such a system would be more attractive to a larger percentage of the population, encouraging higher levels of participation and thus maximizing the number of those receiving some protection. This should result in higher levels of social welfare. Presently, the Ministry of Public Health offers a Poor Card, a Health Card, and Free Services (without card) which are fully or partially

* *The opinions presented here are derived from the study on "The Extension of Social Security to the Self-employed" submitted to the Social Security Office.*

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subsidized. All categories receive similar health care services from public providers. However, these services do not accurately reflect those generally utilized by the middle income class. Hence, the Health Card scheme, which anyone can buy voluntarily, is not popular with the middle income class.

Even though on average self-employed workers belong to the low income class, a great deal of variation within this group exists. A small, more affluent, proportion of this group relies on private insurance; those who are poor rely on social welfare programs such as Health and Poor Cards. But the middle income class of this group either does not qualify or chooses not to use the Poor or Health Cards; but if any catastrophic event happens they can always resort to the Free Service (without card) available from public providers and receive a similar treatment as if they have obtained one of the Cards. Under these circumstances, it is essential that any new program must be distinct from existing ones, especially from the Health and Poor Cards, otherwise it will not attract many users as long as the Free Service (without card) is still available from public providers. But if the program needs public subsidies, the level of subsidies must be appropriate to the maintaining of social harmony and equity. Under the existing situation, a program for the self-employed would be considered by them only as another option for obtaining security related to health care, hence such a program should be voluntary in nature. Even if the program were to be mandatory, enforcement costs would be extremely high, unlike the private employee program for which enforcement costs are low.

If the program is voluntary, it must be designed to suit the needs of a well defined target group. An obvious target would be the middle income group among the self-employed workers, since they are currently the least protected group and they have the potential ability to pay for their own security (or with minimal subsidies). The target group is likely to be the self-employed in urban areas where private insurance is increasingly being bought.

Regarding the package of benefits which should be covered, from a 1998 survey of the self-employed in four provinces (Bangkok, Chiang Mai, Khon Kaen and Songkhla) it is evident that the most desirable benefits are those related to illnesses from general causes. A considerably high proportion of the self-employed also expressed the wish to have the same package of benefits which is offered by the Social Security Office for private employees (namely to include health insurance coverage for sickness unrelated to work, maternity, and disability benefits.) Therefore, in principle, the same benefit package should be offered to them as well as an alternative. However, some preliminary work and conditions must be fulfilled before the implementation of such a program is possible (see below). Therefore, it is recommended that implementation be divided into two phases: starting with the benefits which are urgently needed and where project implementation is feasible; only in the second phase would the full benefit package, such as that of the employee program, be offered.

Whether the contribution should be related to risk or ability to pay is a normative question which depends on the underlying philosophy adopted. If the program is merely a risk sharing device, contributions should vary according to risk; but if cross subsidies among members of the program are needed, contributions should be related to ability to pay. Normally, the premium in private insurance is risk related; and the program automatically excludes those with high risk and low ability to pay. Therefore, if the objective is to increase coverage and improve equity within society, premiums based on ability to pay seem more desirable, and even subsidization cannot be ruled out. However, premiums which are related to ability to pay and unrelated to risk can pose serious problems for any voluntary program because it is likely that only those with high risk and low ability to pay will join the program. If premium is related to ability to pay, benefits should also be related to premiums paid to make the program more attractive. This is because if benefits are unrelated to contributions/premiums, not only will those with high risk join the program but everyone will also try to pay the least amount required to keep the entitlement. Both will lead to serious problem in the program. Thus, on the one hand, in order to improve equity contributions should be related to ability to pay and benefits to need; but such a program will encounter practical difficulties if participation is voluntary. On the other hand, in order to increase coverage through voluntary participation, benefits should be related to contributions. There is no clear answer on how to reconcile this dilemma between achieving equity and overcoming practical problems.

IMPLEMENTATION OPTIONS

Implementation Phases

As mentioned earlier, in principle, the same benefit package of the private employee's scheme should be included in the scheme for the self-employed. However, due to difficulties in assessing their income, which is usually irregular in nature, calculations of contributions (and benefits) based on income may not be possible. Attempts have been made to assess their income based on other characteristics such as age, sex, educational attainment, location, and occupation. However, these variables can account for only a small proportion of the variations in their income. Therefore, until a satisfactory method to classify self-employed workers by income has been developed, contributions cannot be based on income; and only a few of the options of those benefit packages that are urgently needed by the self-employed can be made available.

Based on such limitations, it is proposed that the extension of coverage to self-employed workers be divided into two phases:

Phase I. Contributions are unrelated to ability to pay. Benefits should be designed to fit the needs of some well defined target groups. During this phase, emphasis should not be on increasing the coverage as extensively as possible, but more on strengthening the administrative organization and on learning and gathering information regarding methods needed to access the target groups, the incidence of adverse selection and moral hazard, and measures to deal with these problems. This will lay a strong foundation for the second phase expansion. If the targets are based on some existing organized bodies, such as occupational associations or saving co-operatives, access might be easier, thereby reducing administrative costs. However, except for some professional self-employed associations, most self-employed do not have any organization which they are or can be attached to. Hence, if the program will only allow participation through existing organized bodies, only a low level of coverage for the self-employed can be expected. Criteria to allow the self-employed to form into groups and participate in programs which will increase coverage without serious adverse selection problems are worth further investigating. However, as more experience is gained, coverage should be widened in the later phase. This is usually the pattern followed when extending coverage to the hard to cover groups in most countries.

Phase II. After a method to assess the self-employed workers' income based on their occupations and other measurable characteristics has been developed, contributions could be set that are more closely related to ability to pay and benefits made to reflect contributions made in addition to need. Between phase I and II, it is desirable that each of the existing schemes be modified so as to be better suited to each particular group, and make them more compatible with one another. By that period in development, mandatory universal coverage, with some freedom of choice as to which scheme one would like to participate in according to one's needs, might be possible.

A Proposed Scheme for Phase I

(a) The benefit package. According to the Self-employed Survey, benefits should include medical care, maternity, disability, and funeral expenses, but should exclude all types of compensation for lost income during the period covered. Difficulties in assessing the self-employed workers' incomes is the first reason for excluding income based compensation in the benefit package. If it is to be included, it must be calculated based on other criterion beside their income.[1] The second reason is related to the problem of moral hazard, as it is difficult to check whether self-employed workers have actually lost income while claiming compensation from the program. Finally, the rationale to include first the benefits which protect one from unexpected large expenditures rather than compensation for normal income is because they are the most urgently needed benefits, according to most self-employed workers.

(b) Contributions. As discussed earlier, ideally contributions should be related to the ability to pay. However, due to difficulties in assessing the income of the self-employed, it has been suggested that during the first phase contributions should be at a flat rate (or at most varied by some broad age groups as in the case of private insurance) for everyone who chooses the same benefit package.

(c) Options between individual and family insurance. In the Thai context, self-employed workers should include both the own-account and unpaid family workers. Both groups are equally excluded by the existing system, hence both should be targets of expanded coverage. However, since own-account workers and unpaid family workers are likely to be present in the same household, inclusion via family insurance seems desirable—because having access to the first group will lead to having access to the second group, and family insurance should also help reduce the problem of adverse selection. (This is the approach used in the Health Card Scheme.) A maximum number of members included should be imposed (for example, to cover spouses and at most 3 children). But family insurance may not be attractive to self-employed workers who are single or have some household members already covered under the existing system. Therefore, in order to achieve a better coverage, individual insurance may also made available, but adverse selection could be very high and premiums (or subsidies) must be high to cover the true cost of the program.

(d) Some problems with implementation. The rationale for supporting the introduction of another scheme in the social security system is that the existing schemes do not seem to suit the needs of the self-employed. Thus a new scheme must be designed according to their needs. This does not only mean that the contributions and benefits should be appropriate, but also that implementation must be convenient for them. The following practical considerations have been suggested: (1) The opportunity cost of time of the self-employed seems to be very high, hence they attach high value for convenience in obtaining health care services; this is evident by a high use rate in private clinics. Therefore, in order to make the program attractive to them, using services in private clinics must be an option. (2) Incomes of self-employed workers tend to be irregular, hence the collection of contributions should not be on monthly basis (administrative costs would be too high), but at most once or twice a year. (3) If individual insurance is available, access to the self-employed workers through existing organized groups (such as saving co-operatives, occupational or professional associations, etc.) is advisable because it helps reduce adverse selection. It is also recommended that further study on the incidence of adverse selection and moral hazard, which is essential in determining contributions (and subsidies) and preventive measures, should be undertaken.

FINANCIAL VIABILITY OF A SOCIAL SECURITY PROGRAM FOR THE SELF-EMPLOYED

Analyzing the financial viability of extending the coverage of social security to the self-employed will be limited to the scope proposed for phase I. The analysis consists of comparing costs and willingness to pay, i.e., the actual cost to self-employed workers paid out-of-their pockets for the benefit package proposed, their willingness to pay which is a fixed amount paid for having a guaranteed access to those benefits, and the estimated cost of a program that covers those benefits. If the cost of the program is higher than the willingness to pay, such program would not be feasible without subsidies from external sources. Moreover, if the fixed amount they are willing to pay is lower than the average cost paid out of their pockets, this implies that self-employed workers are not risk aversive. If this is the case, it will be more difficult to design a program which is financially viable and yet attractive enough for them to voluntarily join the program. However, if the fixed amount they are willing to pay is higher than the average cost they actually paid, it implies that self-employed workers are risk aversive. Then it is possible to design an insurance program which is financially viable without external support, provided that the amount is greater than the costs of services provided.

Financial Viability of Health Insurance

This section will compare the costs of the benefit package that includes only health care related benefits. Actual expenditures other than health care (expenditure on child delivery, rehabilitation, and funeral costs) are not available, hence the analysis for other benefit packages in the following section will compare only the willingness to pay with the cost of the program.

From the Self-employed Survey, the average amount that they are willing to pay for health care related benefits (health care for illness, child delivery and disability) is 885 Baht per person per year. If household members are also covered (spouse and no more than 3 children), their willingness to pay is 2,632 Baht per household per year. The majority of the respondents expressed a willingness to pay 20 percent more than the figure they gave initially; hence the maximum willingness to pay would be about 3,158 Baht per household per year (Table 1).

From the 1996 Socio-economic Survey (SES), the average health care expenditure of households headed by an own account worker in the 4 provinces (Bangkok, Chiang Mai, Khon Kaen, and Songkhla) was 5,627 Baht (in 1998 value) per household (Table 1). Actual expenditures are higher than the willingness to pay for health insurance expressed by the self-employed. This implies that the self-employed are not risk aversive and will not pay to exchange uncertainty for certainty. This also means that it is difficult to design an insurance scheme that is attractive enough to them which does not have external support, unless the existence of an insurance scheme somehow induces efficiency improvements in the health care service industries (e.g., health care providers manage to reduce the cost of production without reducing quality, and consumers choose more efficiently). Since such improvements in efficiency are unlikely, subsidies will no doubt be needed to induce the self-employed to take up the program.

The cost of the program for private employees (data are taken from the Planning Division, Social Security Office) in 1997, could be summarized as follows. The costs of providing health care benefits due to (1) any illness unrelated to work, (2) maternity benefits (excluding income compensation), and (3) disability benefits (including both the cost of rehabilitation and income compensation because these are not separable) were, respectively, 708.12, 126.48, and 78.15 Baht per insuree per year. Thus total cost for providing health care benefits (regardless of cause) was 912.75 Baht per insured person per year. The cost of providing health care benefits that extended to household members was estimated to be 3,295 Baht (912.75 Baht * 3.61 average household members = 3,295 Baht); in 1998 prices, the figure would be 3,559 Baht. Thus, the cost is higher than the amount they are willing to pay for health insurance. Hence, a program that is attractive enough for them is almost certain to require subsidies from external sources. Since the self-employed are, on average, older and their morbidity incidence is about 2.5 percent higher than private employee, it is expected that the cost of a program which covers them with health care benefits would be higher. But if household members, which include grown up children who tend to have lower morbidity incidence, are covered, one might expect that the cost would be lower. Hence, it is not clear in which direction the bias lies. However, if adverse selection incidence is high, the cost estimate given above is likely to be an underestimation.

Table 1 Willingness to Pay, Actual Expenditure and the Cost of the Health Insurance Program (Unit: Baht)

	Four Province Combined	Bangkok	Chiang Mai	Khon Kaen	Songkhla
Willingness to pay (Individual)	885	991	1,210	408	808
Willingness to pay (Household)	2,632	3,358	2,219	1,544	2,662
Increase by 20%	3,158	4,030	2,663	1,853	3,194
Actual expenditure	5,627	5,963	3,023	1,246	3,723
Cost of the program	3,559				

Financial Viability for Other Benefit Packages

The willingness to pay for other combinations of benefits and the cost are compared in Table 2. (These figures refer to individual insurance; for household insurance, it could be roughly estimated by multiplying the figures by the average household size). Caution must be taken in using the cost figures which are calculated from the costs incurred by the private employee scheme in 1997. It is likely that the cost figures were under-estimated because adverse selection is expected to be higher in a voluntary scheme.

All the benefit packages shown in Table 2 include health care benefits for illnesses from general causes, which are the benefits most urgently needed by the majority of self-employed workers. The benefit packages are designed as a combination of health care benefits with options to include other types of benefits. It should be noted that the only type of benefit whose cost is lower than willingness to pay is that of paying 30,000 Baht as funeral cost to the funeral organizer; the opposite holds true for all other types of benefits. This implies that the self-employed place a high value on receiving a lump sum payment for funeral costs in the case of death. The reason given by the respondents is that they want to relieve their children of that financial burden. Hence, it seems reasonable to include funeral costs in the benefit package, but with some qualifying period. Likewise, a reasonable qualifying period must be imposed in covering benefits for events which are more likely to happen, such as maternity benefits. Although 7 benefit packages are given in Table 2 only a few are recommended. In order to reduce administrative costs and adverse selection, package I is the most highly recommended (including 4 types of benefits as covered by the private employee scheme, but without income compensation). Even this package needs subsidies from the government because the cost figure excludes administrative costs.

Subsidies and Equity

Extending the coverage of social security is desirable in all societies. A good social security system should be efficient, effective, and allow people to have some freedom of choice regarding the level of protection they receive while maintaining some degree of harmony within society. This is difficult to achieve, especially when the system is composed of several programs which were not initially designed to achieve all these objectives. Usually, the government pays an important role in these programs, as operator, financial supporter, or monitor of the programs. In order to reduce inequities within society, the principle of financial support should be based according to need, i.e., full support for the most destitute and none or minimal support for those who can provide for themselves. This section compares the level of government subsidies in existing programs with the estimated subsidy level needed for the proposed self-employed program, in order to check whether the existing system follows such principles in practice.

The sharing of financial burdens between the beneficiaries and the government (out of general tax revenue) in each of the existing health insurance/welfare programs is given in Table 3. The health care program for government officials could be considered as a kind of occupational fringe benefit, hence the government picks up all the cost of the program. The government officials, pensioners, and their family members who are beneficiaries of the program do not contribute monetarily to the cost of the program. The cost per government official, pensioner (per beneficiary) was estimated to be 6,618 (2,000) Baht per year. In the welfare program for the poor, the government also pays all costs by allocating about 231 Baht per card to the Ministry of Public Health to provide free service to the poor. However, actual cost per card is expected to be higher; and public providers cover the extra cost by cross subsidization between the several programs they are

Table 2 Willingness to Pay and the Cost of Providing Other Benefit Package (Individual)

Benefit Package	Willingness to Pay	Cost of the Program	Percentage Differences
Package I = (1)+(2)+(3)+(4)	1,210	1,039	16.4
Package II = (1)+(2)+(3)	885	986	-10.2
Package III =(1)+(2)+(4)	899	955	-5.9
Package IV = (1)+(3)+(4)	1,048	903	16.0
Package V = (1)+(2)	587	901	-34.8
Package VI = (1)+(3)	723	849	-14.9
Package VII = (1)+(4)	736	818	-10.0

Notes: Numbers represent the following benefits:

(1) Health care for illnesses unrelated to works.
(2) Maternity benefit, 4,000 Baht per delivery and not exceeding 2 deliveries.
(3) Health care related to disability, not exceed 2,000 Baht per month.
(4) Funeral cost of 30,000 Baht for the funeral organizer.

Data Sources: The Survey on Self-employed Willingness To Pay in 1998 and The 1997 Social Security Office Annual Report.

Table 3 The Burden and Percentage Share of Cost by the Beneficiaries and Government in the Existing Schemes (Unit: Baht)

Scheme	Paid by the Beneficiaries	Government	The Percentage of Government Subsidies
The Welfare Program for Government Officials (per government official) [1/]	0	6,618	100
Poor Card (per card) [2/]	0	231+	100
Health Card (per card)	500	500+	50+
The Private Employee's Scheme (per person) [3/]	774	774	33.33
Private Insurance	No information	0	0
The Self-employed (estimated)[4/]			
Household	2,707 (3,158)	346 (403)	11.32
Individual	1,037 (1,210)	299 - 745 (349 - 869)	22.40-41.8

Notes: Baht as of 1996, except number in parenthesis where Baht as of the 1998 value.

Data sources: [1/] Calculated by dividing total health care expenditure for government officials and pensioners by the number of government officials and pensioners in 1996. Since this program coverage the family members of the above, subsidies of the program per eligible person (divided by the average family size) will be about 2,000 Baht.

[2/] From Table 3.2 in Mathana and Somchai 1997 (มัทนา และสมชาย 2540).

[3/] One third of the contribution per insured in 1997.

[4/] Estimated by the authors.

involved with. The subsidy for the Health Card is 500 Baht each, while the insured pay another 500 Baht. Again, actual subsidization is expected to be higher and public providers cover the cost by cross subsidization. In the social insurance program for private employees, the government subsidizes about one third of total contributions, which is equivalent to 774 Baht per employee per year.

The beneficiary bears all of the costs in private insurance. These health insurance/welfare programs could be ranked according to the average income of their (implicit or explicit) target groups, in ascending order, as follows: The Poor Card, Health Card, social security program for private employees, and private insurance; and the percentage of subsidization in each of these programs is 100, 50+, 33.33, and 0, respectively. Hence, with the exception of the welfare program for government officials, the percentage of subsidization seems to follow the principle mentioned above. That is, the percentage of subsidies for persons likely to be in low income groups is higher than that for persons likely to be in high income groups. However, in terms of absolute subsidies, the criterion does not hold. The subsidies per card (Poor Card and Health Card), which covers about 4 household members, are 231 and 500 Baht respectively, while the subsidy per person in the social security program for private employee is 774 Baht per year. This implies that the subsidy for persons likely to be in higher income groups is greater than that for persons likely to be in low income groups.

From previous discussion, it is clear that a program for self-employed workers is not possible without subsidization from the government. The socio-economic status of self-employed workers is comparable to that of private employees. Since the government substantially subsidizes the private employee program, it can be argued that the subsidization of the self-employed program is also justified. If the program charges premiums according to willingness to pay, the level of subsidization per household is estimated to be 401 Baht per year (estimated from the difference between the cost of the program at 3,559 Baht and their willingness to pay for health insurance at 3,158 Baht). Both the absolute (401 Baht) and percentage (11.3%) of subsidization are lower than those in the private employee program. In individual insurance, the willingness to pay is 1,210 baht (Table 3). The level of subsidy would depend on the true cost of the program, which is not known. The true cost depends greatly on the degree of adverse selection in the program. In order to allow for some adverse selection, suppose that the cost is 50–100 percent higher than that of the employee program, then the subsidy would be around 349–869 Baht per person, or about 22.4–41.8 percent. This level of subsidization, both in absolute and percentage terms, is comparable to that for the employee program. This level of subsidization is calculated on the assumption that premiums are charged according to the willingness to pay. However, both the premiums/subsidies are policy variables; and hence can be based on other criteria. But if the premium charged is higher than the willingness to pay, the program will not be attractive enough to induce the self-employed to join. Therefore, one possible criterion is to charge according to the minimum between the willingness to pay and the cost of the program. Thus, the level of subsidization estimated in this section should be viewed as the minimum level of

subsidization that would make the program attractive to the self-employed.

CONCLUSION

With government subsidization at a level comparable to that given to the private employees' program, the extension of social security to the self-employed is highly probable. However, it is recommended that implementation should be divided into two phases. The types of benefit covered during phase I should be limited to what is urgently needed and implementable, namely health care benefits, with options to include funeral benefits, but without income compensation. Extending coverage to other kinds of benefits, especially income compensation, should be delayed until a more satisfactory method to classify the self-employed into income classes for the purpose of calculating their contributions has been developed. Immediate problems regarding the administration of the program are important and need to be addressed. The program must be able to attract a large enough number of self-employed workers to ensure economies of scale in risk sharing and to reduce adverse selection. Access to the self-employed via existing organizations, such as occupational associations or saving co-operatives, etc., which are set up for other purposes is suggested. In order to reduce moral hazard, some measures (e.g., appropriate qualifying periods, co-payment, setting limits on the maximum number of claims per time period, etc.) should be implemented.

On the basis of the foregoing information and conclusions, it might be useful to lay out the next steps necessary for implementing the extension of social security to the self-employed. The decisions needed to complete preparations for phase I are as follows:

1. What will be the benefit package offered to the self-employed? This paper suggests having health care benefits with options to include maternity, health care related to disability, and funeral costs for the funeral organizer; but all compensation due to income loss would be excluded.

2. What size of flat contribution will be charged and how often and how will it be collected? This paper suggests charging premiums according to the minimum between the willingness to pay and the cost of the program. For example, the premium will be approximately 3,200 Baht per household per year for all health care benefits (calculated according to the willingness to pay), or 4,500 Baht per household per year if funeral costs are included (calculated for the cost of the program).

3. What size of subsidy (i.e., to cover administrative costs and differences between contribution and likely cost per worker) will be offered and how will it be financed? If premiums are charged according to willingness to pay, the subsidies would be about 400 + 356 = 756 Baht per household per year, (400 Baht to cover the differences between contributions and likely costs per worker, and 10 percent of true actuary costs for administration); this is approximately the amount the government uses to subsidize each private employee per year. If the benefit package includes funeral costs, subsidies would be 375 Baht per household per year. The estimated subsidy is lower in this case because the contribution covers the actuary cost of the program, hence subsidies are needed to cover administrative costs only.

4. Will contributions be indexed to cover inflation in costs (e.g., social security contributions that are indexed to wages) and what will it be indexed to?

5. Whether insurance should be offered only at a household level, or also at an individual level, and how to define a household and what will be the maximum number of household members covered? This study suggests offering insurance at both levels and covering a maximum of 5 household members. Eligible members should reside in the same household and be related either by blood or by marriage.

6. If insurance for individuals is offered, will membership by the self-employed be allowed only to those organized into groups and what groups would qualify? This study suggests that individual insurance should start only with organized groups. However, since it is expected that only a minority of the self-employed are attached to the existing organized groups, some criteria should be clearly specified to allow the self-employed to form into groups which would qualify their members to join the program.

7. Will there be pre-conditions for group members (e.g., medical examinations, exclusion of coverage for existing conditions, restrictions on coverage)? and if so, what exactly would they be? About one third of the sampled self-employed agreed to have medical examination before joining the program.

8. How would a health service provider be compensated (e.g., capitation fee or fee-for-service) and how big would such compensation be? Capitation seems to be the most likely criterion. If this is the case, health

service providers would be the risk bearer and their willingness to join the program must be explored before determining capitation fees.

In order to proceed further, a task force should be set up by the Social Security Office to decide on the above questions. Implementation of Phase I should be able to begin within 12 months following the setting up of such a task force.

Implementation of Phase II depends upon:-

1. Completion of further survey work on how to assess the self-employed's income in order to move from a flat rate system to one based on income ; and
2. Completion of further review work on how to reduce problems arising from adverse selection and moral hazard.

However, the success of the program also depends on the conditions and practices in other programs as well. Free services which are available at public providers without pre-arrangement or condition will surely reduce the incentive to join this program. It is also a barrier to improve the quality of existing welfare programs which are known to be under serious budget constraints. Hence, although introducing a program for the self-employed is an important step to increase the coverage of social security, a wider scope of reform in the whole system is also needed.

ENDNOTE

[1] In the Self-employed Survey, a hypothetical question about the income compensation was asked based on 50% of the minimum wage in the respondents' province. Such level of compensation did not seem to be attractive enough for two different reasons, some expressed that such compensation was too little to be of practical use, some expressed that with income compensation, the premium will be too high beyond affordable level. If the scheme is meant for the middle income class of the self-employed, the first reason is more likely. Therefore, it is recommended that income compensation should not be included in the benefit package during phase I implementation.

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Human Resource Development: Where to Invest for the Future?*

Somkiat Tangkitvanich**

"In five years' time, all companies will be Internet companies, or they won't be companies at all."

Andy Grove, Chairman of Intel Corporation

1. INTRODUCTION

The new millennium will be the millennium of the 'information society,' where the economy is 'knowledge-based' and the main driving technology is Information and Communications Technology (ICT).[1] The technology has changed the way we lead our lives from the way we work, the way we learn, to the way we live at an unprecedented speed. It has also significantly changed the mix of skills which are demanded by the workplace. The aim of this article is to analyze the impact of ICT on the demand for skills in the context of Asian developing countries, and to draw some policy recommendations concerning human resource development for those countries.

This article is organized in five sections. The first section is the introduction. The second section discusses the impact of ICT on overall economic efficiency and productivity. Section 3 compares operations and human resource requirements between firms that aggressively use ICT to turn themselves into 'virtual firms' and their more traditional counterparts. Section 4 draws some implications of ICT for human resources in Asian developing countries. The last section draws some conclusions and provides recommendations on human resource development policy in preparation for the information society.

2. ICT AND THE 'NEW ECONOMY'

Rapid technological progress in ICT and its speedy proliferation among developed countries have led to speculation that the widespread adoption of ICT will lead to a 'frictionless' economy, i.e., one in which transaction costs gradually approach zero, barriers to entry disappear, markets respond instantaneously and productivity increases substantially. In such an economy, there would be stable economic growth and low inflation, or the so-called 'New Economy.'[2]

Currently, most speculation related to the 'New Economy' can be neither confirmed nor rejected. For example, the impact of ICT on overall productivity, the so-called 'productivity paradox,' is far from being conclusively understood. Economists are especially having difficulties explaining why the widespread adoption of ICT has not resulted in an increase in the official productivity index.

There are plenty of explanations for the productivity paradox. Some argued that the utility and usefulness of the existing ICT are rather limited due to poor design (Landauer 1995). Others have suggested that there is a redistribution effect whereby virtual firms compete away business from their traditional competitors, or that there is a significant time lag between ICT investment and return. Resource misallocation problems—i.e., firms over-allocating their resources toward the accumulation of hardware and software but under-allocating resources to training—is another alternative explanation. There are also macroeconomic explanations. Some have suggested that the amount of ICT capital stock contributes too small a share to the total capital stock in the economy to have any visible impact, while others believe that these are factors that mask ICT's contributions to overall economic growth. Interested readers should refer to Murakami 1998 and Brynjolfsson 1993.

While the impacts of ICT on economy-wide productivity is far from conclusive, there are preliminary results that show that the rate of return of ICT capital is higher than 50 percent. This figure overwhelms that of ordinary capital, which is approximately 30 percent. It must be noted, however, that ICT capital has a higher depreciation rate than does ordinary capital (Murakami 1998). There are also numerous case studies confirming

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that the use of ICT contributed significantly to higher productivity levels among firms. For example, it was shown that ICT helps to reduce production costs, speed up product life cycles, reduce inventories, marketing, and distribution costs, and provides better after-sales service to consumers at lower costs (see, for example, OECD 1999). The next section will discuss in greater detail how ICT improves the competitiveness of a firm and changes the types of skills in demand.

3. IMPACTS OF ICT ON BUSINESS MODELS AND SKILLS DEMANDED

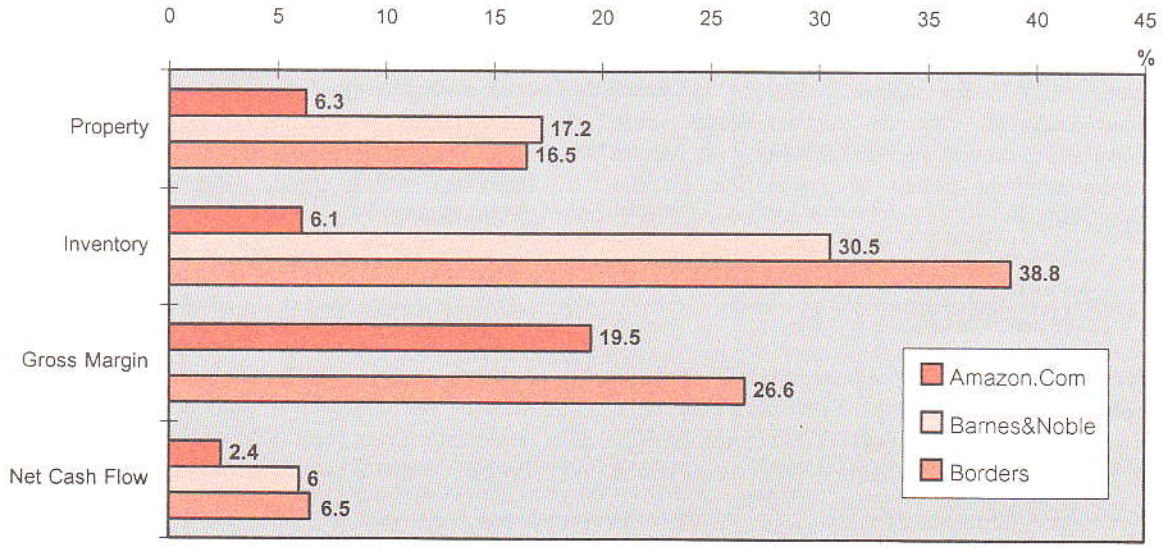
The application of ICT to the world of commerce is best exemplified by the concept of electronic commerce (E-Commerce). Narrowly defined, E-Commerce is the conduct of business on-line, e.g., the selling and buying of products and services through Web storefronts. The actual products traded may be physical products, such as used cars, or services, such as travel services, on-line medical consultation, or distance education. There is an increasing on-line presence of products that can be easily digitized, such as news, audio and video material, database information, software, and all sorts of knowledge-based products.

E-Commerce, however, is not limited to the selling of products on-line. Along with its customers, a virtual firm will also find its suppliers, accountants, methods of payment, government agencies, and competitors on-line. These on-line partners demand changes in the way in which business is done, from production to consumption. Through on-line selling, E-Commerce will lead to significant changes in the way products are customized, distributed, and exchanged, and the way in which consumers search for products and services. In short, the E-Commerce revolution is the revolution of processes. A process-oriented definition of E-Commerce offers a broader view of what E-Commerce represents. Intra-firm processes (e.g., manufacturing, inventory management, corporate financial management, operations), and inter-firm processes (e.g., supply-chain management, bidding) are affected by the same technology and networks as are business-to-consumer processes.

For example, General Electric (GE) has developed a Web-based link to its suppliers known as the Trade Process Network (TPN) in order to receive quick responses from suppliers to its call for bids. The system features an electronic catalog and accommodates electronic purchases, with the option of paying on-line using an electronic credit card. The adoption of the TPN has cut the average length of a procurement cycle in half, processing costs by a third, and the cost of goods purchased by anywhere from 5-50 percent. GE now conducts business worth over $1 billion on the Web annually. The total number of suppliers that it deals with has declined, but the remaining ones have proved more efficient.

To see the impacts of ICT on the way business is conducted, it is useful to compare some operating parameters of virtual and physical stores. Figure 1 and Table 1 compare basic operating statistics in 1997 for Amazon.Com, the most famous virtual bookstore, and its traditional rivals Barnes & Noble and Borders in terms of sales, inventory cost, employment, etc.[3] The rest of this section will analyze and compare operating costs, employment, and skill requirements in virtual and physical firms.

Figure 1 A Comparison of Certain Operational Parameters in 1997 of Amazon.Com, Barnes & Noble, and Borders (unit is percentage of sales)



Source: TDRI, compiled from companies' K-10 reports to the U.S. SEC.

Table 1 Comparing Certain Operational Parameters in 1997 of Amazon.Com, Barnes & Noble and Borders

Operational Parameters	Amazon.Com	Barnes & Noble	Borders
Number of Stores	1	1,011	1,131
Net Sales ($ million)	147	2,797	2,266
% Sales Growth (1996-1997)	838	50	16
Net Income ($ million)	-27.6	53.2	80.2
Valuation as of 1/4/99 ($ million)	18,738	2,766	1,898
Number of Employees	614	27,200	N.A.
Employee/Sales 97 ($ million)	4.18	9.72	N.A.
Employee/Sales 98 ($ million)	3.44	9.65	10.48

Source: TDRI, compiled from companies' K-10 reports to the U.S. SEC.

3.1 Operating Costs

Virtual firms in general operate on much lower gross margins than do their traditional counterparts. For example, Amazon's gross sales margin was only 19.5 percent in 1997, while Borders' was 26.6 percent (Figure 1). This is because the on-line bookstore offers steeper discounts to its customers. However, it is less expensive to maintain an on-line storefront than a traditional one because it does not require display space or storage space. Also, it never has to close, can be accessed by millions worldwide, has few variable costs, and can expand to meet increases in demand. Moreover, by maintaining a single store instead of thousands, inventory costs are minimized. With a smaller inventory and lower property and equipment costs, lower margins are possible.

3.2 Employment

Virtual firms usually employ fewer employees than their traditional counterparts with comparable sales volumes. For example, Amazon.Com, with a sales volume of $148 million, employed only 614 people in 1997 (4.2 employees per $1 million), while Barnes & Noble, with a sales volume of $2.8 billion, had 27,200 employees (9.7 employees per $1 million) (Table 1). The number of employees per sales unit can be much lower for virtual firms that sell high-value products. For example, NECX, a catalog turned E-Commerce seller of personal computers, generated $50 million from its on-line storefront in 1997, but employed only 39 people (0.78 employees per $1 million). Moreover, virtual firms can easily expand the scale of their operations with little increase in the number of employees. For example, during 1997-1998, Amazon.Com expanded its sales volume by 4.1 times while the number of employees increased only 3.4 times. Consequently, in 1998, every 3.44 employees generated $1 million of sales revenue. In comparison, Barnes & Noble could only afford a marginal cut in its workforce, mainly from the introduction of its on-line operations. In 1998, it took 9.65 Barnes & Noble employees to generate $1 million in sales revenue, a figure which is almost triple that of Amazon.Com.

Similar examples of labor savings associated with the use of ICT are abundant. For example, Federal Express reported that their on-line consumer service system saved them from hiring an additional 20,000 people, representing approximately 14 percent of their total labor force. Cisco, the leading U.S. communication equipment manufacturer, reported that it did not have to hire 1,000 new staff for its sales and support group, thanks to its use of E-Commerce. GE reported that its labor costs associated with procurement have declined by 30 percent. These cases suggest that reductions in personnel expenditures can be significant and represent a major cost savings associated with the use of ICT.[4]

3.3 Skill Composition of Workforce

Virtual firms require a very technically skilled workforce, while their traditional counterparts employ only few information technology specialists. Although information on the skill composition of the workforces of the three bookstores is unavailable, it is estimated that engineers and software developers may make up more than 25 percent of the workforce of virtual firms like Amazon.Com. For example, 'Portal' service companies like Yahoo!, Excite and Infoseek Corp. have, respectively, 19 percent, 35 percent and 26 percent of their workforces located in their research and development departments (see Table 2). About half of NECX employees are skilled technical support staff. Thus, one should consider these on-line companies not as ordinary retailers, but as ICT companies. Apart from the technical people, virtual firms also employ personnel with advanced business skills who understand ICT business models.

Table 3 exemplifies some highly paid jobs related to E-Commerce. It should be noted that not all jobs are technical or engineering jobs. In fact, many jobs require matching technological capabilities with business and marketing skills. Inter-personal communication skills are also deemed essential, as the people in charge of each area have to work together as a team.

Table 2 Workforce Composition of 'Portal' Companies

Company	Full-time Employees	Sales & Marketing	Research & Development	Administration and Finance	Other
Excite	434	43%	35%	15%	7%
Infoseek	171	44%	26%	29%	1%
Lycos	137	46%	39%	15%	-
Yahoo!	386	52%	19%	8%	21%

Source: (OECD 1999).

Table 3 Ten New E-Commerce Jobs

Job Title	Maximum Annual Pay ($US)	Background	Task
Entrepreneurial consultant	$250 000	Master of Business Administration or similar, extensive business management experience, consulting firm experience.	To analyze the overall business case for a project and turn around struggling enterprises. Part merchant banker, part visionary, part technocrat – you force your clients to rethink their place in the world and then re-engineer their business.
Application developer	$150 000	Rocket scientist, astrophysicist, pure science researcher, software engineer, Andersen consulting experience, project director, postgraduate degree.	Create new software programs or on-line business tools. New businesses require people to create (develop) the structures (applications) to help them succeed. This may be a new Web site selling technique or a way to share company information among employees.
Fulfillment specialist	$60 000-$100 000	Logistics and transportation/trucking, military procurement, police services, entrepreneurs.	To get the product to the customer.
Consumer behavior consultant	$100 000-plus	Psychologist, writer, journalist, layout designer, magazine editor.	Analyze why people buy things. The AC Nielsens of e-commerce. With so many people using the Web in so many different ways, it is necessary to have adaptive, meaningful measures of success. Someone who can evaluate consumer behavior can help an enterprise better target its audience.
Broker	$200 000-$2 million	Merchant banker, ex-employment agency professional, negotiator (e.g., police or counselor), sales.	Find new business opportunities and staff – a recruiter. As an employment broker you can expect to get 20 percent of the talent's first-year salary in commission. In return, you will find the people from the other nine categories listed here, many of whom will not have direct IT training, but complementary skills that can translate to e-commerce.
Network security specialist	$100 000	Intelligence operative ("spooks" or spies), ex-signals directorate officer, "white" hacker, traditional IT security network manager.	Make sure computer systems are safe from prying eyes.
E-Commerce business analyst	$60 000-$100 000	Accountant, auditor, stockbroker, business manager.	A bean counter, a number cruncher.
Internet architect	$100 000	Webmaster "with muscle," designer, relational database construction.	Put it on the Web. The people who design the site and conceive concepts. A Webmaster controls the team that puts the pages on line, like an editor for a newspaper or magazine.
Product manager	$60 000	Events management, SAP project manager, traditional IT project manager, producer for TV, magazine or radio.	Make sure it stays on the Web. The environment is constantly evolving and e-commerce products need to be kept on track. The day-to-day programming of the Web needs a timekeeper.
Core programmers	$50 000	Programming degree and/or extensive low-level skills in SQL, Java, CORBA and network operating systems, especially Windows NT and Unix. Communications experience in TCP/IP an advantage.	Take care of day-to-day computer programming tasks.

Source: (Cochrane and McIntosh 1998), cited from (OECD 1999).

4. IMPLICATION FOR ASIAN COUNTRIES

Examples from developed countries have clearly shown that ICT has brought about a more efficient means of conducting business and lower transaction costs to the overall economy, which serve to enhance the overall competitiveness of these countries. The pace of the adoption of E-Commerce in these countries is very fast. For example, GE expects to conduct its procurement almost entirely through the TPN bidding system within five years. Other large companies are moving in the same direction. Further adoption of ICT in developed countries will inevitably put increasing pressure on Asian companies, which trade extensively with these countries. Unless they join the electronic supply chain, Asian companies will lose their comparative advantage as suppliers of cheap but high quality parts and raw materials to those large multinational corporations that have fully automated their supply chain management. Recently, central and local governments of some OECD countries, e.g., Canada, have also decided to move their procurement process on-line.

It is conceivable that in a few years small and medium sized Asian companies that are currently supplying parts and raw materials to large companies in the U.S. and Europe will lose their markets unless they integrate themselves into their customers' electronic supply chains. Losses of market share will likely be most pronounced in those sectors that were early adopters of ICT-based trading, e.g., retail, pharmaceutical, automobile, and electronics industries. As the information era is fast approaching, Asian companies will have no choice but to upgrade their ICT capabilities and modify their business models accordingly.

For the above reason, Asian countries are competing intensively with one another to create their own ICT industries. Policy makers in most Asian countries desire to have all the ICT industries in their country—i.e., microelectronics, telecommunications, computer hardware, and software. Most ambitious perhaps is Malaysia's Multimedia Supercorridor (MSC) project that was started in 1997. The objective of this project is to attract ICT multinational corporations to the country. Fearful of falling behind, the Thai government has initiated the software park project to promote the establishment of a local software industry. Singapore, meanwhile, has declared in its E-Commerce master plan that E-Commerce will be central to Singapore's future competitiveness.

Early adoption of ICT in the conducting of business will be crucial to two aspects of the competitiveness of Asian firms. Firstly, as mentioned above, the adoption of ICT will help Asian companies maintain access to markets in developed countries and prepare themselves for new business opportunities. Secondly, as the adoption of ICT becomes widespread, the ICT industry will cease to be a separate industry and become instead the basic infrastructure of the information society. The adoption of ICT will be crucial to maintain the competitiveness of almost every industry, i.e., retail, finance, tourism, manufacturing, etc.

As the world moves forward into the information society, the availability of highly skilled workers will become increasingly important. With trade, investment and financial liberalization, goods, services, and capital can move across borders at lower costs. However, due to regulation, geography, and cultural differences, human resources will never be as mobile as other factors of production. Thus, human capital endowment will become one of the most important factors determining the relative competitiveness of a country in the same way that other non-tradable factors, such as physical infrastructures, are. In the future, a country with a well-educated and relatively cheap workforce skilled in ICT will most likely have a comparative advantage in the production of goods and services.

With this in mind, it is foreseeable that the major stumbling block to the successful adoption of ICT in Asian countries will be their limited ICT human resources. Some Asian countries have already experienced a shortage in ICT skills. India had a work force of approximately 160,000 high-skilled software professionals in 1996-97. Although it supplies graduates at a pace of about 55,000 a year, this may be insufficient to keep pace with its software industry which is growing by over 40 percent a year. At the moment, Malaysian universities are producing less than 6,000 ICT engineers a year, while demand is estimated at 10,000 or more.[5]

5. POLICY RECOMMENDATIONS

In the short term, Asian countries can cope with the problem of ICT labor shortages by changing their laws and regulations to allow greater cross-border labor mobility. For example, Singapore is attracting foreign skilled workers by lowering the cost of renting houses, providing tax deductions for employers who undertake overseas recruitment, and reviewing the criteria for eligibility of employment pass holders (CSC 1998). Similarly, the MSC status companies in Malaysia have been given full flexibility to recruit knowledge workers from abroad under the MSC's Bill of Guarantees (PriceWaterhouse 1998). The long-term solution for most countries, however, requires that skilled labor be homegrown.

5.1 Expansion of Tertiary Education

The expansion of tertiary education will be necessary for a country aiming to enter the information era. It will bring about not only more equity, but also more efficiency since it will provide a larger pool of talented people for the workplace to draw on. Currently, college enrollment ratios in most developing Asian countries are relatively low. In some countries, e.g., Thailand and Indonesia, this is due to low enrollment ratios at the secondary level. The draft National

Education Act of Thailand, which mandates free universal education until 12th grade, marked an important step forward. In the case of Malaysia, where enrollment ratios in secondary education are already high, the objective is to raise the enrollment ratio in tertiary educational institutions from the current 13 percent to 20 percent by the year 2000. However, it will not be sufficient just to increase the overall enrollment level. For long-term growth, increasing the proportion of students majoring in mathematics, science, and engineering will also be important (Murphy et al. 1991). Thus, the expansion of tertiary education in science and technology would yield high economic and social returns for some Asian countries, especially Thailand and the Philippines, where the current proportion of students majoring in these fields is relatively low.

5.2 Reform of Formal Education Curriculum

As was shown in section 3, those skills needed by the ICT industry will be considerably different from those currently provided by formal education. Thus, there is an urgent need to reform curriculums accordingly. The overall direction of the new curriculum should aim to reduce the traditional emphasis on the learning of factual knowledge and focus more instead on the learning of 'information-processing skills.' This is because memorized facts will be of little use in an age in which the volume of information doubles every two to three years, and becomes obsolete quickly. Moreover, we now have products of the new technology, e.g., CD-ROMs and the Internet, which can readily provide facts at a very low cost.[6]

Workforces of the future will need to be ICT literate so as to be able to access the information required for problem solving. They also need to learn information-processing skills in order to be able to utilize these facts. They will also be required to be information literate and capable of abstract thinking, systems thinking, presentation, inter-personal communication, and collaboration. Subjects tailored for such a curriculum would tend to be more 'meta-subjects'—i.e., subjects that are more concerned with learning how to learn rather than merely the learning of facts. To achieve this, radical and new ways of thinking are needed. For example, to stimulate collaboration among students, it may be necessary to evaluate students under a new incentive system that takes information production and information sharing into account.

5.3 Reform of Training Systems

To develop a new training system for ICT skills effectively, we need to take into consideration their unique characteristics. Firstly, most of them are 'tacit' rather than 'codified' forms of knowledge that require a lot of training and experience in order to operate efficiently. Secondly, because of the rapid pace of technological change, training and continuous re-training are necessary. Otherwise the accumulated skills will rapidly become obsolete. For example, within ten years most of the technology we operate today will be obsolete, and have been replaced by new technology. Thirdly, most ICT skills will be generic skills, some will be industry specific skills, and a few will be firm-specific skills. For example, the skills required to write computer programs could be employed in any firm or industry. Thus, there are potential spillovers when ICT personnel changes job. Also investment in ICT training can generate additional spillovers by enhancing the level of technical sophistication of the overall economy, thereby allowing it to operate more efficiently.

In short, while the accumulation of ICT skills requires extensive investments in training, externalities raise the questions of whether private investment alone will provide optimal returns, and whether there are rationales for government intervention in the marketplace. However, considering that skilled personnel will be highly paid, there should be incentives for workers to invest in training themselves. Thus, instead of fully subsidizing potential ICT and other skilled workers, the government should devise a scheme by which the cost of training is suitably allocated among workers, businesses, and the public. Incentive schemes that cover part of the training cost could be designed to encourage individuals and businesses to invest more in training in some cases, e.g., where training leads to certifiable and critical skills.

Institutional innovations will also be important. The government should encourage firms with many highly skilled workers to adopt new compensation schemes, e.g., performance-based variable pay, employee stock options (ESOPs), etc., to retain talented staff. Closer interaction between the workplace and educational institutes will also be necessary. Finally, special attention needs to be paid to the training of workers who cannot keep up with the changing technology to facilitate their transfer to other jobs.

ENDNOTES

1. Broadly defined, ICT encompasses everything from telecommunications, broadcasting, information processing technologies, home and office electronics, e.g., television, video, karaoke equipment, copiers, etc. In this paper, we restrict our definition and analysis to only the 'core' ICT, those associated with computers, i.e., software and hardware, and communications.

2. Alan Greenspan, the chairman of U.S. Federal Reserve, testified to the Congress in July 1997 that the increases in productivity achieved by advance in ICT may have produced the kind of inflation-free economic growth seen only once or twice in a century.

3. More recent data is available from the U.S. Securities and Exchange Commission (SEC). However, only the 1997 data is directly comparable since after that

Amazon has opened overseas branches and new lines of business, e.g., music and movies. While Barnes & Nobles also opened up an on-line bookstore in May 1997, its on-line sales in that year were not significant.

4 The impact of the use of ICT on employment has raised concerns about 'jobless growth' and has generated a lot of debate in developed countries. Currently, there are no conclusive results, but preliminary studies seem to indicate that while ICT may displace particular jobs, it has also created many other indirect jobs through inter-industry linkages and induced additional jobs through consumption linkages, resulting in net positive job creation. For example, see Passamonti and Lucchi 1998.

5 In fact, there is a critical shortage of ICT workers worldwide. In the U.S. alone, for example, it is reported that about 190,000 high technology jobs remained unfilled. Worldwide shortage is estimated to be around 400,000, and the shortfall is expected to continue for another decade due to the widespread of E-Commerce.

6 However, this doesn't mean that we need only information processing skills. We still need certain fact-based knowledge skills. Examples of such knowledge include so-called 'cultural literacy.' Students of the future still have to learn languages, humanities, fine arts, morals, and values. Schools still have the responsibility to introduce students to a full range of human knowledge. It is occupational skills that will have to shift from factual knowledge to information processing skills.

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Role of Bangkok and Its Periphery in the Asia-Pacific Region: Toward Globalization Economy and Sustainable Development*

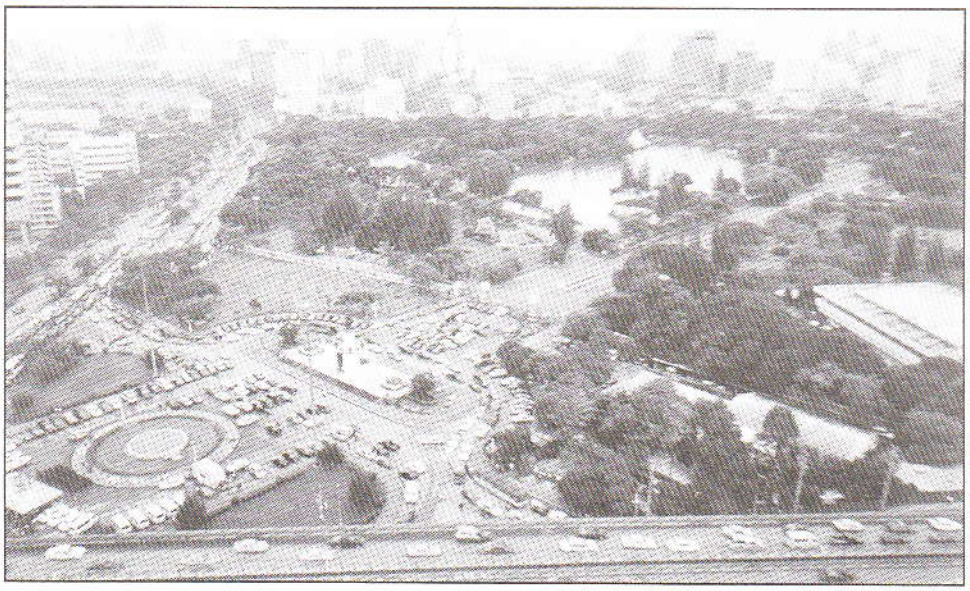
Sauwalak Kittiprapas**

The Asia Pacific region (APR) has become an important center in the global economy. Within this region, Thailand has emerged as a strategic location for the destination of foreign direct investment (FDI) and flows of trade, information, and people. These transnational movements have affected the social behavior of Thai people and the spatial economy of the country and its cities. The capital city, Bangkok, and its extended periphery have undergone extensive transformations over the past three decades. The provinces most affected by the economic boom and recent bust are contained within the "Extended Bangkok Region" (EBR), which consists of the Bangkok Metropolitan Region (BMR)[1] and the core Eastern Seaboard (ESB).[2] This region remains important for the national economy, despite the current economic crisis.

The EBR is, no doubt, Thailand's strategic point of international linkages for both trade and people. The region is highly linked to the global economy and the APR. Most of international trade flows through the 'Klong-Tuey' Bangkok port and the 'Laem Chabang' port in ESB, which have been highly integrated with Asian ports—especially from Singapore, followed by Hong Kong and Japan. The Bangkok international airport (Don Muang) is an important transportation hub in Asia-Pacific. The majority of tourists (more than 60%) visiting Thailand during 1995-1998 came from East Asian countries. Toward the millennium, the EBR continues to transform itself both in function and form.

CHANGES IN ECONOMIC DEVELOPMENT OF BANGKOK AND ITS PERIPHERY

No matter what geographical scale is considered, the role of Bangkok and its surrounding area within the



While Bangkok's economy has restructured toward higher value services activities, the main infrastructure bottleneck of the city continues to be in the area of transportation.

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national economy is evident. In 1995, the per capita income of the metropolitan area of Bangkok was about four times as much as the national average, and the share of Bangkok in national GDP was approximately 40 percent. Until the mid-1990s the regional income disparity between the EBR and the rest of the nation still increased as trends of per capita regional income of the five surrounding provinces and the three core ESB provinces also continued to increase, growing more rapidly than the national average. These trends confirmed the role of the capital area and the continuing regional divergence within the country.

There are internal and external factors impacting the spatial development and urban transformation in Thailand. There have been changes in migration and industrial location trends in the recent past, resulting from domestic and foreign impacts of linkages to the global economy.

While the Bangkok area's central role in Thailand's growth has been attributed to its geographical location[3] and agglomeration economies advantages, governmental policies have also played an important part in the concentration of economic activities in the area. Previous Economic and Social development plans (Plans I to V) have enhanced urban-based industrialization and led to a high concentration of economic activities in Bangkok, which was the only international trade point in the country and a domestic transportation hub.

Before the mid-1980s, global investment was concentrated in the city of Bangkok as a destination, but during the latter years of the decade investment spread to its periphery. Industrial development in Thailand during the mid-1980s to the early-1990s, when the Thai economy expanded drastically with double digit growth, led to the spatial restructuring of Bangkok and the EBR. As a result of the so-called "flying-geese" pattern of development, Thailand, which had comparative advantages in location specific endowments (i.e., labor, raw materials, basic infrastructure) and macro economic policies (i.e., investment promotion, exchange rate stability, etc.), emerged as an important manufacturing center in East and Southeast Asia beginning in the mid-1980s. At the same time, operating costs, particularly land and labor, in Bangkok continued to rise. Peripheral regions (the BMR and the ESB) eventually became more competitive, affecting domestic location choices of industry.

The shifts in the location of investment are still limited to the EBR because Bangkok and it surrounding regions have the nation's highest quality of infrastructure, social facilities, and human capital and therefore continue to gain the highest share of FDI and industrial investment. In 1994, the EBR accounted for 33 percent of all new firms and 40 percent of new investments; however, the location of manufacturing establishments within the EBR shifted from Bangkok proper to the ESB. Thus, while most industrial firm growth continued to take place within the EBR, the direction of new manufacturing establishments shifted to the eastern corridor. Transportation infrastructure now makes the trip from Bangkok to the ESB convenient. This accompanied major infrastructure developments (such as ports and industrial estate facilities). At the same time, Bangkok's core area became a center for clusters of services and small scale manufacturing activities. The dispersal phenomena within the EBR was somewhat similar to what had taken place in Jabotabek, Indonesia, in the late 1980s (Soegijoko and Kusbiantoro 1998).

RESTRUCTURING WITHIN THE EXTENDED BANGKOK REGION

Global forces are increasingly driving the structural changes in the economy of the EBR. With the increasing industrial FDI inflows to Thailand, and more specifically into the EBR, the region underwent spatial and economic restructuring. At first, manufacturing firms chose Bangkok as a location, but as the costs of land and labor in the city rose and major infrastructure investment projects in the Eastern Seaboard developed, large new firms, especially heavy industries, chose to locate in the five surrounding provinces or in the ESB. Bangkok, however, continued to be the home of a large number of small-scale industries[4] and has the highest concentration of workers. Consequently, Bangkok's economy is increasingly dominated by the service sector and small-scale operations.

The importance of the service sector to Bangkok's economy, and the importance of industry to both the five surrounding provinces and the ESB, are indicated by sectoral location quotients of employment[5] (LQ) and sectoral GDP growth.[6] Bangkok service sector LQ has dominated its industrial sector LQ since the late 1980s. The five surrounding provinces have specialized in industrial production since 1977, while in the Eastern region the industrial sector has clearly dominated since 1989, corresponding to the development of the ESB. Although the five surrounding provinces and the ESB specialize in manufacturing industry, their sectoral characteristics are quite different. Industries in the five surrounding provinces are mainly light industries such as electronics and textiles, while industrial clusters in the ESB are heavy industries such as petrochemicals, oil refineries, and steel.

Among the service sub-sectors in Bangkok, retail and wholesale trade, banking and finance, and transportation and utilities are the most important in terms of GDP share. In 1995, these sectors accounted for 46.3 percent of Bangkok's GDP (outweighing the manufacturing sector share which contributed 31.1 percent). During the bubble period of 1989-1993, within the BMR's GDP, the banking, insurance, and real estate sectors had grown the fastest, followed by the manufacturing sector. Bangkok city dominates the business and professional service sector of the country with all of the nation's commercial banking headquarters located within it. Bangkok's domination of the service sector[7] (i.e., indicated by variables of service value added, com-

mercial bank loans and deposits) increased from 1990 to 1995, demonstrating the continuing concentration of service activities, while the industrial value added component declined. While Bangkok has lost some of its share of the industrial population, Bangkok's share of the nation's urban population has also declined from 57 percent in 1990 to 36 percent in 1995.

For the five surrounding provinces and the ESB, the contribution of manufacturing to GDP dominates other sectors of the economy. The sub-regions gained the highest proportion of new employment of BOI approved industries during the 1988-1993 period.[8] Employment in light industries, textiles and garments, services and agro-industries were the engines of growth for the five surrounding provinces, while the ESB's employment gains were the highest among metal fabrication and parts, ceramics and glassware, and chemical and paper products. The ESB also attracted the highest percentage of new BOI-approved foreign registered capital (approximately 70% in 1995).

Although the five surrounding provinces had the highest share in terms of the number of projects and total employment of BOI-approved industries during 1988-1993, the value of capital investment still lagged behind that of Bangkok and the ESB. That reflects the fact that large scale capital investment projects (heavy industries) have recently been located in the ESB, and production units in Bangkok are likely to be for high value-added functions. As industries located in the five surrounding provinces are mostly light and labor-intensive industries, the area has not dominated capital investment but rather large-scale labor employment projects.

Bangkok has passed the industrial development stage and its economy has restructured toward higher value services activities. The five surrounding provinces absorbed the economic sprawl as manufacturing production moved away from the city. The core ESB region is increasingly becoming an important center for heavy industries. Its future depends on accessibility to global economy and increasing investments in infrastructure, agglomeration economies from existing industrial clusters, and national promotion programs.

Sub-regional specialization is expected to increase along with the increase in trade flows among regions/nations. The increase in global economic integration, with trends to lower trade barriers (i.e., AFTA tariff removal), would be factors supporting the enhancement of specialization in industrial locations resulting from increasing import and export activities. Then, these sub-regions in the EBR will face economic restructuring—more specialized in different functions of economic activities—although they are very closely related and interact as if they were one region. The developing specialization among these sub-regions, driven by their unique comparative advantages, has also led to structural interdependence within the entire EBR.

How fast the sub-regions' specialization has restructured also depends on many factors. As Krugman (1996) pointed out, the observation of such mega-city growth may in part be a result of the pattern of development of the national transportation infrastructure in which the primal city is also a hub of national transport network. Therefore, future development patterns in the provision of communication infrastructure as well as the competition between regional factors of production will be crucial factors determining the spatial development of Thai industry.

TOWARD GLOBALIZATION AND SUSTAINABLE DEVELOPMENT

Global movements in communication, international trade, and human capital will be significant factors affecting national and spatial development. In the 21th century, trends in globalization will be driven by revolutions in telecommunications rather than manufacturing and production. Distance costs become less important while time-responsiveness will become crucial in productivity competitiveness.

As communication tools (e.g., computers) are portable, the spatial location of working units can be more dispersed because of the ease of communicating through computing information technology. Thus, more independent working units can be located outside the expensive core business areas which will be left to do face-to-face communication and business activities. Because of decreased distance costs in communications, individual units (offices and production bases) can be dispersed. At the same time, clusters of particular industries or sectors may become more concentrated in order to take advantage of rapid changes in technology and "just in time" production. However, industrial clusters also depend on historical and supporting factors of particular activities and locations (see examples in Krugman 1991).

As technological innovation and information will become more crucial than traditional endowment factors such as natural resources, "creative assets" of people-made advantages (from technological advantages to particular labor skills) will increasingly become the determining factor in attracting FDI. Thus, enhancing the skills of local people is very important to sustained economic investment and growth.

CONSTRAINTS FOR BANGKOK'S SUSTAINABLE DEVELOPMENT AND MANAGEMENT

In order to make Bangkok a livable city, three main areas currently constraining Bangkok's sustainable development in the global economy are the provision of transportation and communication infrastructure, environmental deterioration, and human resource development.

The limited authority of the local government, sectoral fragmentation among government agencies and

inter-governmental relationships, however, somewhat limit the ability of the BMA government to directly improve the living conditions of the city.[9] Nevertheless, progress has been made in these three areas.

Infrastructure Development

Communication infrastructure is considered a key factor to future global competitiveness in the information age and having reached this, privatization and sectoral reform regulations are underway. Telecommunication projects within Bangkok include the expansion of telephone lines, national satellite projects, cable networks, and new high-technology installations such as the Integrated Service Digital Network (ISDN) and fiber optic networks.

There has been a great increase in the number of telephone lines in Thailand since the late 1980s,[10] specially after the Telephone Organization of Thailand (TOT) granted concessions for providing new telephone lines and services to private companies, which facilitated the installation. Presently, many of these advanced communication services, including mobile phones, paging services, ISDN, leased circuits, data communications, and internet services are under Build-Transfer-Operate (BTO) concessions given to private-sector investors by the two state monopolies: the TOT for domestic services, and the Communications Authority of Thailand (CAT) for international services. Private investment, including foreign joint ventures through BTO's, has led to a drastic expansion in telecommunication infrastructure, which enables the country as a whole, and Bangkok in particular, to move higher up the ladder of development into a more value-added manufacturing and service based economy. According to WTO regulations, all telecommunication businesses must be liberalized by 2006 after TOT and CAT are privatized. A more competitive structure within these industries as well as technological innovations in the future are expected to lower costs and offer people easier access to information. With market liberalization toward the millennium, the costs should become more affordable and should enhance the economic growth of the city and the APR linkages.

The main infrastructure bottleneck in Bangkok continues to be in the area of transportation. Traffic congestion has been a serious problem for Bangkok for several decades. Time consuming commutes and wasted energy are responsible for significant losses of economic production[11] and negative health effects.[12] The root cause is the city's lack of efficient public and mass transportation systems. Though many mass transit systems have been planned over the past 25 years, they were not effectively implemented. Mass transit systems and expressways were not coordinated between the jurisdictions of various government agencies; for example, these projects required coordination between the Highways Department within the Ministry of Transport and Communications, the State Railways of Thailand (SRT), the Expressways and Rapid Transit Authority (ETA), and the Bangkok Metropolitan Administration (BMA), among others.

The current efforts to relieve the problems have met with mixed success. Positive signs, however, include the current construction of subway and elevated rail systems. Several different mass transit plans were designed or constructed in Bangkok in 1990 (Unger 1998).

Before the crisis the ESB was slated to be the location for a variety of major transportation related infrastructure developments designed to serve industrial development. Projects included the expansion of the major port (Laem Chabang Port Phase II), a high-speed train system, a dual rail train system, the Second Bangkok International Airport (at Nong Ngu Hao), and a Global Transpark at U-Tapao. Most of these projects had to be financed through private means rather than government investment. The major deep-sea ports in the ESB will continue to draw shipping activities away from the Bangkok port and thus increase export and import related activities in the ESB. The global transpark facility was planned to provide inter-connections between air, land, sea, and telecommunications systems, thereby facilitating the delivery of components on "just in time" schedules. As a result of the financial crisis, some projects have been delayed (such as the high speed train), while some are being scaled down (such as the global transpark project).

Infrastructure development projects require strong institutional arrangements for their swift and successful completion. Within Thailand, as many agencies are involved in projects in overlapping areas, conflicts between different agencies commonly occur. The coordination of the proposals, planning, and construction (of mass transit systems, for example) fall under the authority of different agencies. Needless to say, these agencies are not coordinating their efforts. Local governments have no authority to manage major development projects in their jurisdictions because most such projects, such as expressways, subways, and elevated rail systems, and utilities such as piped water and electricity in Bangkok are under the authority of central government agencies. The BMA has no authority to manage or build up integrated development plans for solving infrastructure bottlenecks in the city effectively. Traffic in Bangkok, for example, is a long-term problem handled by more than ten central government agencies, which has led to delays and difficulties in solving the problem.

Environmental Problems

A serious obstacle to Bangkok's sustainable development is the high level of urban environmental degradation. The most serious problems are those of air quality, traffic, the shortage of open space (public parks), slums, sewerage service, and land pollution (i.e., due to the dumping of chemical pollutants and hazardous substances) (Kruger Consult 1996). Pollution in

cities is very much from traffic-related activities. The most serious problem—air pollution—and in Bangkok approximately 60-70 percent of it is the product of the city's traffic (Utis and Webster 1995).

Traffic-related noise levels are also a problem within Bangkok. In certain locations the noise levels are above 80 decibels, vs. the 70 decibels standard. As truck traffic contributes significantly to noise problem, measures to control the access routes of truck traffic to the inner city during certain times may help reduce noise problem.

The second most serious environmental problem within Bangkok is water pollution caused by domestic waste. Flooding seems to be a perennial problem for Bangkok because there is no long-term flood prevention plan for this city of low elevation and high land subsidence.

Another problem that was generated by urbanization resulting from rapid industrialization is the creation of poor working environments for the employees. Many factories contribute to work-related injuries or have dangerous working conditions. This problem requires the effective enforcement of accident prevention and health regulations. In addition, workers are affected by the poor environment from spending a long time in traffic and air pollution while commuting to work.

While Bangkok city's industrial base shifts to services and light-industry, the type of urban environmental stresses will change. While vehicle emission is the largest source of air pollution in Bangkok and continues to be a problem in the city, emissions from industrial sources are also harmful, particularly for the industrial areas in ESB, because major industrial problems causing health risks have shifted to the ESB. In this area, the heavy industry is a significant contributor to declining air quality. Industrial zones, especially those with petrochemical plants or oil refineries, are blamed for health problems in their neighborhoods. As evidenced by the contemporary history of Bangkok, these problems are difficult to solve once the land development has taken place. Relocating industries or communities later is costly. Obviously, new forms of urban management and regulation are needed to tackle these issues, for they will be the way to prevent environmental stress into the twenty-first century.

Human Resource Development

The new knowledge society of the twenty-first century places a premium on human resources as a determining factor for a country's successful economic development. As the Thai economy is highly integrated into the global economy, the country's workforce must be prepared, with the skills necessary for the rapidly changing needs and demands of the global market. The country currently has relatively low human capital for higher-value production and knowledge-intensive activities. Education and training systems must adjust to meet these challenges so as to gain comparative advantages. To be competitive in the global economy of the twenty-first century, Bangkok needs to offer various kinds of effective training in order to prepare people for the dynamic changes of a modern economy.

Modern technology also demands high level skills which can be gained through both education and on job training. A shortage of skilled labor is currently a major constraint for Thailand in its attempt to climb up to the "late industry" stage; Thailand is currently far behind the Newly Industrialized Countries (NICs) in enrollment in technical training and tertiary institutions. At any rate, Bangkok has gained the highest share of the country's human resources.

As well-timed responses will be more critical in production than cheap labor in the future global economy, the training of human capital has to be supported by information technology infrastructure as well. As "created assets" from human capital are likely to be the most important factors underlining growth in the globalization economy, local institutions and policy planners will have to deal seriously with preparing human resources for the dynamic changes in the EBR.

STRATEGIC ROLES FOR BANGKOK AND CITY MANAGEMENT TOWARD THE MILLENIUM

Flows of international trade as well as human resources will affect the economic growth of these subregions. Strategic roles of Bangkok, the five surrounding provinces, and the core ESB regions, for Thailand and for the APR should be based on their comparative advantages, nationally and internationally. While, Bangkok's surrounding provinces and the ESB have emerged as important industrial bases for multinational operations, Bangkok itself has more advantages in attracting a number of service sectors.

Concerning the constraints to Bangkok's development to date, the city should strengthen its role in the sectors in which it has comparative advantages compared with other Asian Pacific cities. Bangkok may be able to well serve the APR in a number of service functions. Bangkok should concern itself with the service functions associated with manufacturing production, such as front office functions of multinational operations, rather than the back offices of production functions. Apart from manufacturing-support service functions, Bangkok has been famous for its excellent tourism-related services (such as hotel accommodations, food, shopping, entertainment, etc.) and still attracts foreign tourists from virtually every part of the world. Increasing flows of global visitors along with the relatively greater freedom of the Thai media (compared to other Southeast Asian countries) may also enable the city to support and develop international mass media, assuming that good infrastructure like telecommunications can be provided.

As Bangkok is in a strategic location for international transportation within the Indo-china region, Bangkok has opportunities to strengthen its position as a regional transportation hub (especially air transportation), as well as plays a leading role in the regional development of various aspects, such as education, trade, and tourism services. With further development of transnational transport links, Bangkok can serve as a gateway to the Indochina region while the ESB can also serve as an important manufacturing center and a major port for the region.

Development Management

Given the current limitions on government revenue, more private sector involvement is necessary to finance prioritized projects for urban infrastructure and environment. Currently, regulatory reform for the privatization of state enterprises and infrastructure projects are underway, although private investment levels are being affected by the current crisis. Many infrastructure projects in Bangkok have been planned for privatization such as expressway systems, the state-owned Bangkok Metropolitan Transit Authority, metropolitan rail transit systems, community trains and elevated highway projects, as well as many telecommunication projects.

To finance the much needed urban environmental infrastructure, privatization of environmental management activities (e.g., solid waste disposal and wastewater treatment) is recommended. Also, methods such as the cost-recovery pricing of environmental infrastructure (i.e., for wastewater or solid waste management) would help the supply of environmental facilities meets the demand.

In addition to environmental regulations, policy options should take the costs of environmental degradation into account in pricing policies. The implementation of pollution pricing (i.e., fuel taxes, charges on old vehicles) would be an effective way to reduce pollution from traffic-related activities. In addition, the pollution pricing would be an undistorted mechanism for deconcentrating industry away from Bangkok. Currently, energy prices and taxes, for example, are national prices with the same rates across the board. Thus, the cost of local environmental degradation cannot be taken into account without local pricing policies. Similar to infrastructure development, the local government has limited authority in dealing with local environmental pricing policies and regulations. To that end, local governments which currently have no authority should be empowered to implement local pricing policies. Increasing local empowerment and decentralization can help management in integrating infrastructure development plans.

Bangkok also has to move forward in upgrading products and services. To be competitive in the future global economy of the APR, products and services have to meet globally acceptable standards of quality, with competitive production costs. The ability of workers to use modern technology and information is essential for cost-competitive quality manufacturing and production, as well as for the provision of advanced business services.

Think "Global" Act "Local"

It is important for local people, planners, and policy makers to prepare for future changes. This also calls for increasing public and private participation and the empowerment of local authorities in managing city development. Education systems should be able to adjust training programs that respond to the rapid dynamic changes. Only with global thinking, knowledge, and ideas will Bangkok have the capability to manage challenges and take advantage of new opportunities and intelligently adjust to the global economy of the twenty-first century.

ENDNOTES

1. The BMR includes Bangkok and its five surrounding provinces, Nonthaburi, Pathum Thani, Samut Prakan, Samut Sakhon and Nakhon Pathom. However, the BMR is not a legal or governing entity. There are no regional governments in Thailand.
2. The ESB includes the core Eastern Seaboard provinces of Chachoengsao, Chon Buri, and Rayong.
3. Bangkok is located on the delta plain of the Chao Phraya River, and has historically been the center for inter-regional transportation networks. The river was formerly the main commercial transportation route within the country and the delta port, on the Gulf of Thailand, promoted international linkages. Thus, since the early nineteenth century the city has dominated the urban system of the country.
4. Bangkok still accounts for the largest share of factories registered, approximate 48 percent of all factories in 1995.
5. The employment index reflects the cluster of workers within each sector. See Sauwalak (1995) for detail formular and analysis.
6. Analyse from sectoral GDP by provinces. Data from the National Economic and Social Development Board (NESDB).
7. See agglomeration indexes in Sauwalak (1995).
8. Data from the Board of Investment (BOI).
9. From an interview with the BMA's deputy director of Policy and Planning Division.
10. See details in Pipat (1998).
11. A study backed by the Japanese government suggested that Bangkok was losing about a third of its

potential production to the impact of traffic congestion (Unger 1998).

[12] Results of a study by Maneerut (1996) suggest that suspended particulate matter in Bangkok is significantly related to respiratory morbidity in the city. This is a significant finding since respiratory morbidity accounts for as much as 13 percent of total morbidity for Bangkok.

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