

# Thailand's Education Sector at a Crossroads: Selected Issues

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This study does not pretend to present facts about Thai education that are not already known to policymakers and researchers in the country. In the course of the mission's work 1/, it became abundantly clear that an enviable degree of analytical expertise exists in the various agencies concerned with education, both in government and in the larger research community. Much of Thai authorities' knowledge about the sector is, moreover, derived from a substantial body of well-designed and sophisticated studies based on data from regular and systematic surveys and other activities. Taken together, these studies yield a clear and timely view of most aspects of the sector and public policies therein.

In this rich context, the scope of the present study is intentionally narrow. Taking into account the time constraint, as well as a realistic assessment of the World Bank's comparative advantage, it was felt that a potentially useful approach lies in providing an external perspective on Thai education, with a focus on overall sectoral development. Thus, rather than indepth micro-level analysis, the study attempts to draw together in an integrated framework various disparate pieces of available data and analyses of the sector. Where appropriate, it also uses comparative data to highlight contrasts between Thailand and other countries in Asia. It is hoped that despite its selected focus, the study would contribute to the ongoing debate among Thai policymakers and researchers regarding future directions for education.

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1/ The mission visited Thailand between March 26 - April 10, 1990. Its members were Jean-Pierre Jarousse, Alain Mingat (consultants) and Jee-Peng Tan (ASIVP). The mission's work was greatly facilitated by the ready willingness of Thai officials and researchers to share their time, data, and insights.

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## EXECUTIVE SUMMARY

i. Thailand's overall macroeconomic environment during the past few decades has been highly favorable for educational development. Steady economic growth combined with the success of family planning has meant a sustained easing of financial constraints and demographic pressures on the sector. These circumstances are likely to persist in the foreseeable future, but clear signs of structural shifts in the economy are emerging, signifying a need to explore new directions for the education sector.

ii. These shifts stem, in part, from fundamental changes in Thai agriculture, currently still the dominant sector of production and employment in the economy. Until recently, the abundance of land has limited the application of modern farming technology, encouraged labor-intensive methods in agriculture, and supported the sector's absorption of a major share of the workforce. Since the mid 1980s, however, this land-based source of economic growth has become increasingly unsustainable owing to the shrinking availability of new lands. As a result, the economy is moving toward more traditional patterns of growth, with evidence of a rising reliance on non-labor and technology-intensive inputs in agriculture, and expanding roles for the industrial and services sectors. Concomitantly, a shift in employment away from agriculture is emerging and can be expected to continue.

iii. Reinforcing each other, these trends have contributed to the recent surge in demand for better educated labor, as reflected, for example, in job vacancy trends and employers' increasingly frequent reports of difficulty in recruiting and keeping such workers. In this context, the education sector has a clearly critical role. Its capacity to respond to the rising demand for educated workers is essential to facilitate the economy's transition to its new structure.

iv. This report argues that an adequate response probably requires substantial changes in various aspects of the sector, most importantly in higher education with regard to its structure and arrangements for student finance. At the other levels, changes are also called for, mostly to reduce disparities in access, and to enhance the spatial efficiency of public education.

### Higher education.

v. Thailand's higher education system is exceptional in its composition, encompassing conventional public and private institutions, as well as two large-scale open/distance universities which enroll the bulk of students at this level of study. The obvious merit of this arrangement is that it helps to accommodate the strong social demand for higher education while keeping overall costs relatively small. With an average enrollment ratio of about 20 percent, the system's coverage is well above that in other countries at Thailand's per capita income level. However, the corresponding production of graduates is somewhat lower than expected, because students enrolled in the open/distance systems are prone to relatively high dropout

rates, and, among the remaining students, the completion of a degree takes, on average, about twice as long as in conventional settings.

vi. In terms of earnings, which reflect productivity on the labor market to some extent, graduates from conventional universities generally fare better than those from the open/distance systems. The gap is due to differences in field of study, as well as students' socioeconomic background. Standardizing for these variables, they earn only modestly less: 2 percent less than graduates from private institutions, and 6 percent less than graduates from the non-prestigious public institutions (that is, excluding Chulalongkorn, Thammasat and Mahidol). The relatively small differences suggest that in fields for which instruction is offered in the open/distance system, a student who survives the odds of dropping out in that system can expect to earn competitive wages in the labor market. This result, combined with the fact that unit costs are modest compared to those in conventional institutions suggests that the open/distance system is probably a relatively efficient mode for producing certain types of workers, notably in fields other than science and technology.

vii. Institutional mode of future expansion. The above observations are relevant in considering the options for expanding higher education in response to recent labor market signals. The demand for educated workers is strong, but most particularly for people skilled in such fields as business, and science and technology. In this context, it is clear that the open/distance universities can play only a partial role in responding to the indicated demand, given that laboratory-based courses in science and technology are not easily or effectively rendered in their setting. To the extent that the current pattern of labor demand persists--as it can be expected to in view of the economy's structural changes--future expansion of enrollments would therefore need to rely significantly on instruction being conducted in the conventional sector, possibly with the creation of new institutions.

viii. Diversification of the system. Concomitant with such expansion, there is a need (at the sectoral, though not necessarily at the institutional level) to diversify and broaden the spectrum of course offerings within the indicated specializations. This development would serve two important purposes: improve the responsiveness of higher education to the economy's demand for diverse levels of skills; and provide opportunities to a broader group of students who can derive substantial benefit from courses of study that match their capability more closely than those currently offered in most conventional institutions. For this reason, if new public institutions are created, they should probably not be patterned on the exceptional standards of existing ones. At the same time, policymakers could consider relaxing the stringent regulations that currently govern private universities, while at the same time providing for their accreditation on a differentiated scale of academic excellence.

ix. Special mention should be made of the existing teacher colleges, and the role they might play in diversifying higher education. Although these colleges have traditionally prepared their graduates for teaching jobs, signs are emerging of shifts toward a broader labor market mission. This shift is hampered, however, by constraints on resources and facilities, particularly

for courses in science and technology. Given the benefits of building on an already existing infrastructure, consideration could therefore be given to the upgrading of teacher colleges as part of the government's overall plan to rationalize the expansion of higher education.

x. Another facet of diversification is the spatial location of new or upgraded tertiary-level institutions. Since labor market forces motivate the expansion of graduate output, consideration could be given to targeting or locating institutions outside the Bangkok region, matching industries' spread to the provinces. One argument is that their proximity to industrial sites would hopefully promote collaboration to stimulate mutually beneficial research in applied technology. Perhaps as important, location outside Bangkok would achieve a more even geographical distribution of educational opportunity than now exists in Thailand, with the added benefit of lowering the costs of board and lodging for students (given that the cost-of-living in the provinces is significantly lower than in Bangkok). This move would also help provincial students who currently rely largely on media-based instruction to gain access to laboratory-based instruction, thereby enhancing their ability to benefit from emerging labor market opportunities.

xi. Financing arrangements. Integral to the package of desired changes are improved mechanisms for student finance in the context of a more rational pricing policy in public universities. Currently, access to conventional universities, whether public or private, is highly skewed toward students from rich families. This outcome is not surprising in private institutions given the high fees charged, and the embryonic state of student loan schemes in the country. In public universities, academic merit rather than ability-to-pay is the basis of selection (as it should be), but the outcome in terms of student composition is virtually identical. Thus, the exceptionally low fees in these high-cost institutions (with a cost recovery rate averaging only 6 percent) imply a blanket subsidy for people who clearly can afford to pay much more.

xii. If, in response to the growing demand for university graduates, places in the public sector are expanded without a change in fee policy, inequity in the subsector would worsen to the extent that the extra places are taken up by people who would otherwise have registered as fee-paying students in the private sector. The incremental heavy subsidies (on average, exceeding Bhat 50,000 per student annually in 1989, or 1.6 times the per capita GNP) involved would also represent an inefficient use of public resources, since they support the expansion of undergraduate education which generate relatively few externalities, rather than activities such as graduate studies and research for which subsidies are better justified.

xiii. A new system of higher education finance is needed to forestall these outcomes, and encourage the development of a more sustainable basis for expanding higher education. The report provides strong support for the government's consideration of substantially increased fees in public conventional universities, coupled with scholarships of (possibly) varying amounts awarded on the basis of academic caliber, family income, or a combination of these criteria. At the same time, the National Teacher Council Board's proposal to launch a student loan scheme warrants support, and its implementation should be closely monitored to identify ways to strengthen it

for broadened access to private universities, particularly among people with limited funds to finance their studies.

### Secondary education.

xiv. At 30 percent, Thailand's enrollment ratio at this level of education lags substantially behind that in other Asian countries, and falls below what might be expected in a country at Thailand's per capita income level. These striking disparities, reinforced by recent signals and trends in labor market demand for secondary school leavers, have made the expansion of secondary education a special priority of the government. Administratively, an important measure was the recent cabinet decision to provide for compulsory lower secondary education. Some observers have argued for additional intervention through financial incentives in the form of subsidies to cover direct costs and forgone income.

xv. The analysis of this report suggests, however, that such strong intervention, if intended for everyone, is probably not warranted. Transition rates between grades 6 and 7 have been rising in recent years, revealing a surprising degree of overall responsiveness to the buoyant labor market demand for secondary school leavers, even before compulsory legislation was introduced. There is perhaps stronger justification for targeting the subsidies more narrowly, mainly on equity grounds, to reduce what appears to be substantial disparities in transition rates across regions and socioeconomic groups (for example, these rates are close to 100 percent in Bangkok, but only 22 percent in Nakhon Ratchasima province, 23 percent in Udon Thani, 28 percent in Yala, and 49 percent in Lop Buri).

xvi. In upper secondary education, expansion of enrollments is, on balance, justified by recent employment trends and the need to enlarge the pool of candidates from which an expanding higher education system can draw its intake. However, public intervention beyond the provision of financial incentives sharply targeted toward children from disadvantaged backgrounds, is debatable. As before, one reason is that the demand behavior of prospective upper secondary students is quite responsive to market signals. More importantly, this behavior is shown in this report to be strongly influenced, not so much by the labor market value of upper secondary education per se (indeed private rates of return are quite low, according to data for 1986), as by its value as a prerequisite for higher education (that is, its option value), which currently fetches an exceptionally attractive private rate of return.

xvii. In this context, it is argued that changes to the structure and financing of higher education--along the lines advocated earlier--represent perhaps the most effective measures to promote the efficient expansion of upper secondary education. These changes would essentially smooth out the discontinuities in rates of return across the two levels of education, thereby reducing the effect of the option value of upper secondary education, and enhancing the impact of its market value in guiding individuals' demand behavior. In view of the strong demand for people with

skills in science and technology, consideration could be given to strengthening science courses in the secondary school curricula.

Primary education.

xviii. Nearly all children enter grade 1 at present, but the rate of survival to the end of the cycle averages 83 percent, with significant variation across geographic regions, reaching as low as 56 percent in Yala province. Although Thailand's average exceeds the mean survival rate for Asia as a whole (62 percent), it is significantly below that in such countries as Korea and Malaysia where the rate is closer to 100 percent. The dropout problem appears to be especially striking in the early grades of primary education, pointing to a possible need to focus attention and resources on this part of the cycle, especially in the deficit regions.

xix. To this end, various interventions can be considered, such as improved access to preschool education, increased provision of resource materials for both teachers and pupils in the laggard provinces, use of different pedagogical approaches and methods, and so on. Tradeoffs and complementarity among the various options probably exist, so the design of an optimal package would need to take into account the impact of each intervention relative to its costs in the different settings. Analysis of these relationships would be desirable to guide future actions to improve survival rates. However, owing to time and data constraints, such analysis was excluded from the scope of the present report.

xx. It is noteworthy that the resources needed to improve primary education can probably be mobilized to a large extent within the subsector by enhancing its internal efficiency. Thailand's unit costs in primary education (expressed as a ratio of the per capita GNP) are currently almost twice as high as the average among Asian countries, mainly reflecting an exceptionally low pupil-teacher ratio (19:1 compared to the average of 33:1 for Asia). Interestingly, as recently as 1970, Thailand's ratio was as high as 35:1, so its decline to the current low level suggests that the production of teachers has not been sufficiently attuned to the country's sharp demographic transition in recent years.

xxi. While low pupil-teacher ratios are attractive in theory, there is no empirical evidence of an association with better outcomes in student achievement, at least in the range of pupil-teacher ratios currently characterizing Thailand and other Asian countries. Because higher pupil-teacher ratios would lower unit costs without affecting learning outcomes, moving in this general direction would improve efficiency in primary education.

xxii. To operationalize this change requires consideration of new arrangements in the spatial grouping of pupils, including the introduction of multigrade classes (in which pupils from two or more contiguous grades are combined for instruction under one teacher) and possible consolidation of small schools (which tend to limit the scope for organizing larger classes). Given the projected decline in the size of the primary school-age population

and the already very low pupil-teacher ratios in Thailand, implementing these changes would effectively require that a significant number of existing primary teachers be retrained for other work, possibly as pre-primary or lower secondary teachers where personnel needs are emerging rapidly. Obviously, not all primary teachers can be retrained for such work, so the scope for retraining may be limited, and the selection for training would need to be designed accordingly.

xxiii. An improved spatial arrangement that includes provision for multigrade teaching need not necessarily increase distances between a school and pupils' homes. In some situations, however, school consolidation may be a more economic arrangement, in which case accessibility would become a real concern. Pupils from poorer families are likely to be worst affected since they can least afford the increase in travel costs, and so may discontinue schooling. While this adverse outcome is a possibility, the evidence provided in this report suggests that at present the spatial arrangements in the subsector are such as to leave much scope for improvement without compromising equity. Indeed, if the savings from enhanced efficiency (i.e. larger schools and class sizes) were used to raise overall survival rates in primary education, equity would in fact improve insofar as those who currently dropout prematurely come mostly from lower-income families.

### Conclusion

xxiv. Overall, Thailand's educational system is in respectable condition. It needs to be reshaped somewhat, however, to prepare for the country's entry into the twenty-first century on a sound footing. Three priorities stand out. First, a closer match between the output of the education system and the needs of the economy is desired in light of emerging structural shifts in the economy, and the clear trend toward greater industrialization. The rising demand for graduates at the secondary and higher education levels might be better met by changing the institutional composition and financing arrangements in higher education along the lines discussed earlier, as well as by promoting science education at both levels.

xxv. Second, social selectivity in the education system would need to be reduced in order to prevent the emergence of a disenfranchised social underclass. Given the current characteristics of the system, consideration could be given to the provision of scholarships for secondary education sharply targeted toward those from poor families. Perhaps as importantly, attention is also warranted to improve survival rates in primary education.

xxvi. Third, there is scope for making better use of the resources currently available in the sector, particularly, but not exclusively, in primary education. The savings from greater efficiency could be use to help finance expansion at the secondary and tertiary levels, as well as allocated to enhance educational quality in primary education, particularly in the early grades.

## I. THE MACROECONOMIC CONTEXT

1.1. The Thai economy has been growing steadily during the last two to three decades (Table 1.1). Growth has been particularly rapid in recent years, making Thailand a member of the select club of countries currently enjoying double-digit growth rates. Although economic prospects over the next 10 to 15 years are difficult to predict with any accuracy, forecasts published by various agencies project expansion at the rate of about 8-10 percent p.a., reflecting confidence in the sustainability of the current pattern of high growth. The buoyant outlook implies that substantial potential exists for mobilizing additional resources for the sector from both public and private sources.

Table 1.1: Real growth rates by economic sector, Thailand, 1965-1989

	<u>1965-80</u>	<u>1981-85</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
Agriculture	4.6	4.9	1.4	-2.5		
Industry	9.8	5.0	6.5	9.9		
Services	7.6	6.3	4.9	9.1		
Total GDP	7.2	5.6	4.7	7.1	11.0	13.1

Sources: World Bank, 1988; TDRI, 1989.

1.2. During the last 20 years, the country's demographic profile has shifted dramatically, resulting from a highly successful family planning program. Of particular relevance to the education sector is the reduction in the relative size of the school-age population, and the corresponding lightening of working adults' fiscal burden for public spending on education. The dependency ratio <sup>2/</sup> has been declining steadily since 1970, and the downward trend is expected to continue over the next 10 years (Table 1.2).

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<sup>2/</sup> Defined here simply as the ratio of the population aged 6-14 to that aged over 14.

Table 1.2: Population growth rates and dependency ratios in Thailand, 1965-2000

	<u>1965-80</u>	<u>1980-87</u>	<u>1987-2000</u>		
Annual growth rate (% p.a.)					
Overall population	2.9	2.0			1.5
Population aged 6-11		0.2			-0.2
Population aged 15-21		2.3			0.2
	<u>1970</u>	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>2000</u>
Dependency ratio a/	56	55	47	41	29

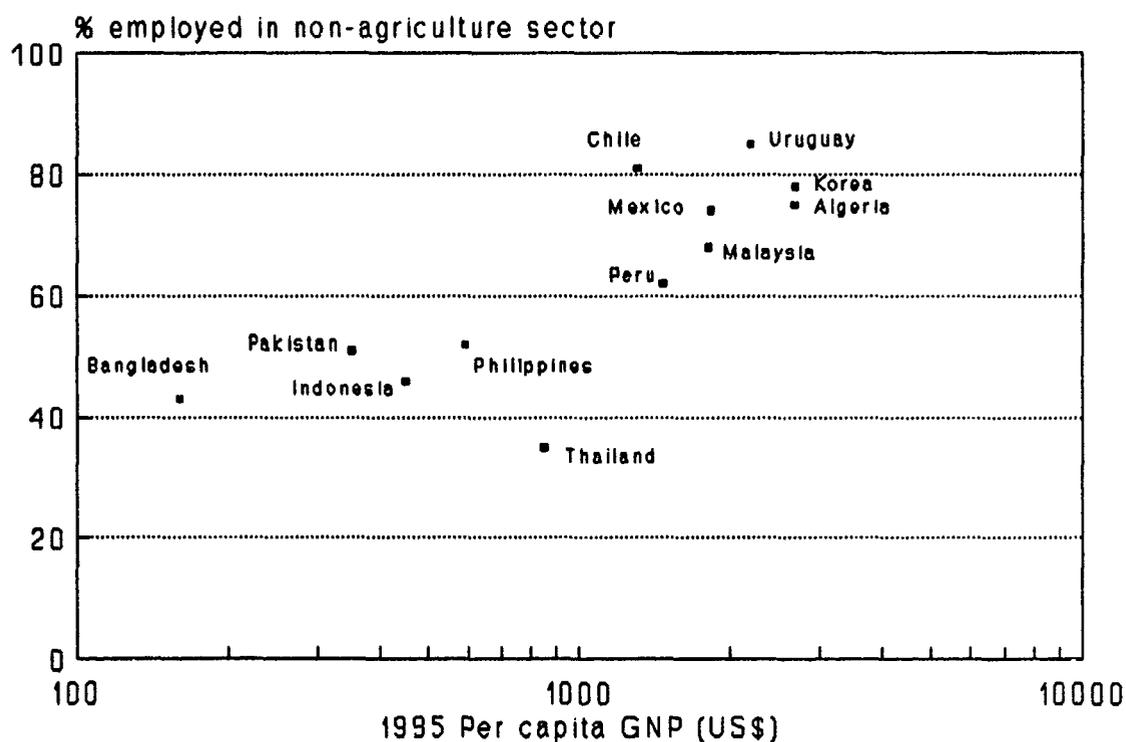
Sources: World Bank, 1989; NSO, 1989; Tan and Mingat, 1989.

a/ Population aged 6-14 relative to population aged 14 and above.

1.3. Taken together, these economic and demographic prospects signify a particularly favorable context for educational development in the foreseeable future. Thus, while the sector is not entirely free from problems, financial constraints are not expected to be the foremost among them. As in any setting, however, prudence in the use resources remains relevant to discussions about sectoral policy.

1.4. The structure of the economy is a third aspect of the macro context with important linkages to educational development. Agriculture has been and still is a predominant sector, employing nearly two-thirds of the labor force in the late 1980s. Correspondingly, the industrial and service sectors are relatively small, and are, moreover, confined mostly to the Bangkok metropolitan areas. That Thailand is currently less industrialized than other countries at similar income levels is apparent from Figure 1.1 which shows, for a sample of developing countries, the link between the share of employment in non-agricultural sectors and per capita GNP.

1.5. In agriculture, past growth has resulted mainly from the expansion of cultivated area, with productivity remaining relatively modest, and farming methods labor-intensive. These latter characteristics of Thai agriculture, captured by the comparative data in Table 1.3, dampens the demand for moderately to highly educated workers, and explains why Thai education is, in aggregate terms, hitherto somewhat less well-developed than might be expected given the country's income level.



Sources: based on ILO, 1988 & WDR, 1989.

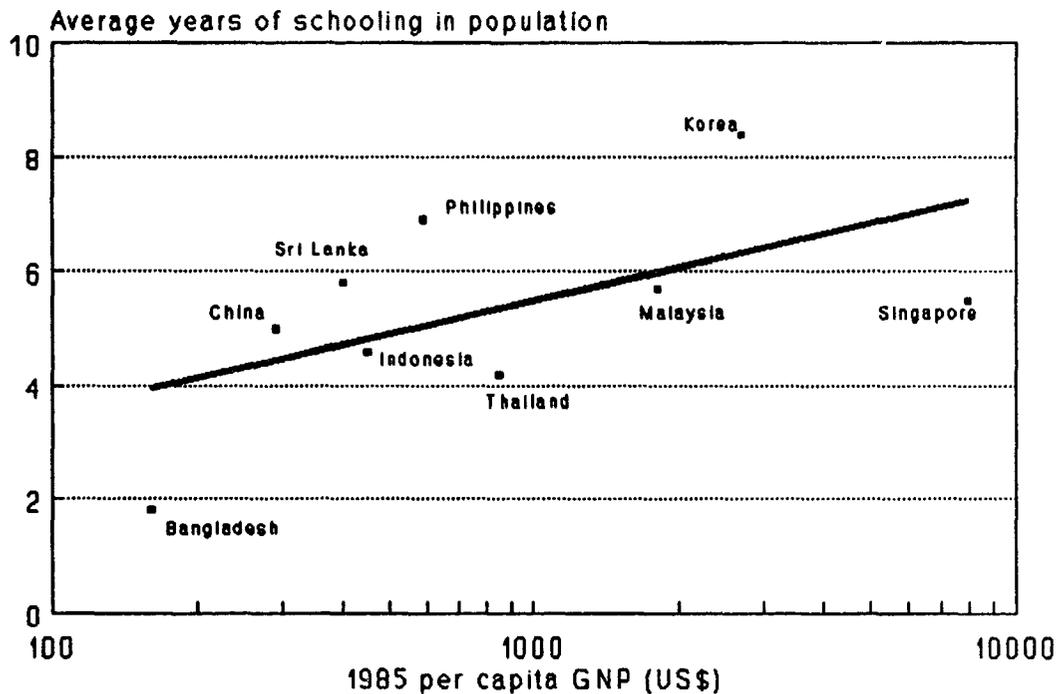
**Figure 1.1:** Relationship between share of employment in non-agricultural sector and per capita GNP, selected countries, circa 1985

**Table 1.3:** Thai agriculture in a comparative perspective, 1986-87

	Agriculture's (%) share of		R1/R2	Fertilizer use (gm of nutrients per ha.)
	GNP (R1)	Employment (R2)		
Thailand	16	64.4	0.25	236
Bangladesh	47	57.5	0.82	673
Indonesia	26	40.4	0.64	980
Korea	11	21.7	0.51	3850
Malaysia	20	31.8	0.63	1570
Philippines	24	47.6	0.50	425

Sources: ILO, 1988; World Bank, 1989.

1.6. To illustrate, Figure 1.2 shows, for a sample of Asian countries, the relationship between the average grade attainment of the school-age population and per capita GNP <sup>3/</sup>. The relationship is positive, with Thailand lying below the average pattern. The country's actual grade attainment is 4.2 years, but based on the overall experience among Asian countries, a value nearer 5.5 years would have been more characteristic at Thailand's income level.



Source: Tan and Mingat (1989)

**Figure 1.2:** Relationship between average grade attainment and per capita GNP, Asian countries, circa 1985

<sup>3/</sup> The average grade attainment of the school-age population is a rough measure of educational development. Derived from the data on enrollment ratios across the three levels of education, it encapsulates in one figure, information about the size and structure of enrollments.

1.7. Thailand's current relative position is unlikely to persist, however, given recent trends in the economy. Signs are emerging, for example, of shifts in employment patterns (Table 1.4). Up until 1981, the agriculture sector absorbed growing numbers of workers, but this year appears to mark the beginning of a plateau in its absorptive capacity. Meanwhile, employment has grown more vigorously in the other sectors, so that despite a steady workforce, agriculture's share of total employment has been declining steadily since 1971.

1.8. These shifts stem, in part, from fundamental changes in Thai agriculture. As a source of growth, expansion of cultivated area has become increasingly limited by the shrinking availability of new lands. Between 1972 and 1981, cultivated acreage expanded by 43 percent, but the rate of expansion has leveled off in subsequent years. As a result, Thai agriculture increasingly follows the more traditional patterns of growth characterized by greater reliance on non-labor inputs, and improved labor productivity. This change has facilitated the movement of labor into non-agricultural employment.

Table 1.4: Employment by major economic sectors, Thailand, 1971-1988

	<u>Total number employed (millions)</u>				<u>Share of labor force (%)</u>			
	<u>Agriculture</u>	<u>Industry</u>	<u>Services</u>	<u>Total</u>	<u>Agriculture</u>	<u>Industry</u>	<u>Services</u>	<u>Total</u>
1971	13.77	0.96	2.72	17.45	78.9	5.5	15.6	100
1975	14.18	1.69	3.44	19.31	73.4	8.8	17.8	100
1980	16.09	2.32	4.27	22.68	70.9	10.2	18.8	100
1981	17.81	2.35	4.56	24.72	72.0	9.5	18.4	100
1982	17.43	2.68	5.26	25.37	68.7	10.6	20.7	100
1983	17.40	2.51	5.27	25.18	69.1	10.0	20.9	100
1984	18.13	2.77	5.10	26.00	69.7	10.7	19.6	100
1985	18.09	2.74	5.43	26.26	68.9	10.4	20.7	100
1986	18.13	2.76	6.13	27.02	67.1	10.2	22.7	100
1987	17.79	3.13	6.72	27.64	64.4	11.3	24.3	100
1988								

Sources: World Bank, 1988; Sussangkarn, 1987; NSO, 1987a, 1988.

1.9. The expansion of such employment, modest thus far, would probably gain momentum. To appreciate the potential scale of future changes, consider the following simple projection. If the economy grows at 6 per cent p.a., income levels will more than double in ten years' time, and the share of employment in industry and services can be expected to reach as high 65-80 percent, a significant jump from the present share of only 36 percent. This scenario is obviously only an informed projection, based on other country's experience, and may differ from actual outcomes in 2000. The main point, however, is that with economic growth, the share of employment in non-agricultural sectors is likely to become much larger than it is at present.

1.10. Aside from employment patterns, the trend toward a more industrialized economy is also likely to fuel a growing demand for better-

educated workers. Shifts in the educational profile of the workforce are in fact already emerging (Table 1.5). Whereas the rate of growth of employment among people with primary education or less has been declining with time, it has been accelerating among those with secondary schooling. Employment of workers with higher education has expanded at particularly high rates. Between 1972 and 1988, the share of secondary school leavers in the labor force more than doubled, from 3.6 to 7.9 percent. During the same period, the share of workers with higher education rose from 0.3 to 3.3 percent, more than a ten-fold increase.

**Table 1.5:** Employment trends by educational attainment, Thailand 1972-1987

	Number employed ('000)			
	1972	1977	1984	1988
Primary or less	15,203	18,884 (4.4)	22,839 (2.7)	24,703 (2.0)
Secondary	583	803 (6.6)	1,449 (8.8)	2,341 (12.7)
Vocational	115	219 (13.7)	555 (13.8)	737 (7.3)
Teacher training	153	240 (9.4)	525 (12.6)	572 (2.2)
Higher education	56	157 (22.7)	434 (15.8)	967 (22.2)
Total	16,116	20,303 (4.7)	25,999 (3.6)	29,464 (3.2)

Note: Figures in parentheses refer to the annual rate of increase in the number employed between the reference year and the year indicated in the previous column.

Sources: Sussangkarn, 1987; NSO, 1988.

1.11. The distribution of jobs between the public and private sectors is another important feature of future employment dynamics, particularly as regards highly educated workers. In the past, the civil service was a major destination of university leavers, but signs are that this source of jobs is drying up (Table 1.6). Compare, for example, rates of employment growth in private firms and in the government: it was significantly lower in the private than public sector between 1977-1984, but this pattern was reversed after 1984 <sup>4/</sup>. For university graduates the evolving shift in job opportunities is

<sup>4/</sup> The own-account category refers mostly to self-employed people, and is shown separately from the "private" group.

especially striking. Among graduates from all types of institutions, the proportion working in government jobs six months after graduation dropped between 1984 and 1987. The private sector, already a major employer at present, thus appears likely to play an even larger role in future.

Table 1.6: The shift in supply of jobs between the public and private sectors, Thailand 1977-1987

<u>Avg. growth in employment (% p.a.)</u>	<u>1977-84</u>	<u>1984-87</u>
Private sector	6.8	6.7
Government	9.5	4.8
Own-account	2.6	0.5
All sectors	3.6	2.1
<u>University leavers: % in public sector jobs six months after graduation</u>	<u>1984</u>	<u>1987</u>
Selective public universities	56.8	41.7
Open/distance public institutions	62.8	54.0
Private institutions	19.8	17.8
All types of institutions	57.9	46.1

Sources: For employment growth rates, data are from Sussangkarn, 1987; and NSO, 1987a; for data on university leavers, data are from MUA, 1985 and 1989.

1.12. To summarize this brief overview, the Thai economy is unmistakably poised on the threshold of what could potentially be dramatic shifts in structure. The speed and nature of this transformation depends, in part, on changes in labor productivity. In this context, education plays an indisputably crucial role, recognition of which is reflected in the explicit and strong emphasis on human resource development in the newly-formulated Seventh Plan. Given the current status of Thai education, the task ahead involves not only rapid expansion of coverage, but probably also concomitant structural changes to enhance the system's responsiveness to fast-changing social and economic conditions, as well as to ensure the long-term sustainability of expansion. In a sense, therefore, the education sector is at a cross-roads. Its future development becomes all the more challenging if the country's aspiration to the status of a newly industrialized country, following the model of, say, Taiwan or Korea, is to be realized.

## II. CURRENT STATUS AND STRUCTURE OF THE EDUCATION SYSTEM

2.1. To provide a context for the discussions in subsequent chapters, several salient features of the education sector are set out below. Attention is drawn to relevant comparative data, as well as to the unique arrangements in Thai higher education.

### II.1 Public spending on education and its distribution

2.2. Data showing trends in spending since 1977 appear in Table 2.1. Overall government spending has been relatively stable at around 17-19 percent of GDP between 1977 and 1990. However, the share of education in this budget has been declining gently, with the pattern broken only with the upturn in 1990; expressed in relation to GDP, aggregate spending on education shows a similar pattern of fluctuation. The spending levels in Thailand are nevertheless comparable to those in other Asian countries: in the mid-1980s, the regional public expenditure on education averaged about 3.3 percent of GDP, and 12.6 percent of total government spending.

Table 2.1: Public spending on education in Thailand, 1977-1990

	<u>Govt. budget</u> <u>as % of GDP</u>	<u>Education spending as % of</u>	
		<u>Govt. budget</u>	<u>GDP</u>
1977	16.7	21.6	3.6
1982	18.4	20.1	3.7
1986	19.2	18.7	3.6
1987	18.4	18.1	3.3
1988	16.6	18.0	3.0
1989	16.9	16.6	2.8
1990	17.7	18.0	3.2

Source: BOB, 1986-90.

2.3. The distribution of public spending by level of education is shown in Table 2.2. More than half of total educational expenditures go for primary education, the share being stable since 1982. The proportions allocated to secondary and higher education have been rising gradually, with corresponding declines in allocations for the vocational and "other" categories (the latter includes administrative costs and spending on adult and other education). Given the aggregate nature of the data, and the possibility of overlapping definitions, these shifts reflect modest changes to which significant meaning should not be attached. Compared to the average country in Asia, Thailand's allocation for primary education is relatively large and is similar to the pattern in such countries as Korea, Indonesia, and the Philippines.

**Table 2.2:** Percentage distribution of public spending on education by subsector, Thailand, 1982-1990

	<u>Primary</u>	<u>Secondary</u>	<u>Higher</u>	<u>Voc.</u>	<u>Other a/</u>	<u>Total</u>
1982	54	17	12	10	8	100
1983	55	16	12	9	7	100
1984	56	18	12	9	4	100
1985	57	19	10	9	4	100
1986	57	19	11	9	4	100
1987	58	19	12	7	4	100
1988	57	19	13	7	4	100
1989	57	17	14	7	5	100
1990	56	20	14	6	5	100
Asia average (circa 1985)	48	31	19	-	3	100

Sources: NEC, 1989b; BOB, 1989 and 1990; data for Asia are from Tan and Mingat (1989).

a/ Includes spending on administrative overheads, and on adult and other education.

## II.2 Enrollments at the lower levels

2.4. The data in Table 2.3 indicate that enrollment ratios in primary and secondary education have been relatively stable between 1982 and 1989. In contrast, there has been significant increases in coverage at the pre-primary level, with the enrollment ratio rising from just over 10 percent in 1982 to 34 percent in 1989. This trend coincides with the government's expanding role as a direct provider of pre-school education, as well as increasing women's participation in the labor force.

**Table 2.3:** Enrollment ratios by level, Thailand, 1982-1989

	<u>Pre-primary</u>	<u>Primary</u>	<u>Secondary</u>		<u>Overall</u>
			<u>Lower</u>	<u>Upper</u>	
1982	10.9	98.9	32.0	26.6	29.3
1986	25.9	95.1	34.3	24.4	29.4
1987	30.3	94.7	32.8	24.1	28.5
1988	36.1	92.7	-	-	30.0
1989	33.6	92.2	-	-	30.4

Sources: Setapanich, 1989 for data for 1982 and 1986; other years calculated from NEC printout on enrollments and NSO (1989) data on population by age.

2.5. How does Thailand's profile compare with that of other countries? For primary education, the enrollment ratio is not a particularly revealing indicator, as most countries show a figure close to the plateau of 100

percent, and differences are compressed around this value. The cohort survival rate <sup>5/</sup>, to be discussed in more detail in a later chapter, is a better indicator. Thailand's figure for this statistic, at 83 percent, compares well with the Asian average of about 62 percent. There is nevertheless some room for improvement, given the experience of such countries as Korea and Malaysia, where virtually all children in primary education actually complete the entire cycle.

2.6. In secondary education, a very different picture emerges. With an enrollment ratio of 30 percent at present, Thailand lags considerably behind other Asian countries, including those at much lower levels of income; Sri Lanka, for example, has a per capita GNP only about half as high as Thailand's, but an enrollment ratio over twice as high. International data in fact suggest that an enrollment ratio of about 40 percent would have been more characteristic of a country at Thailand's income level. Looking 10 years ahead, the country's per capita GNP is expected to rise by 1.85 times (in real terms) if the economy grows at the projected rate of 6 percent p.a., and the population at 1.8 percent p.a. The average secondary enrollment ratio for countries currently at this higher income level is about 63 percent. These aggregate considerations provide a first indication of the future prospect for expanding secondary education in Thailand. The economic context and justification for moving in this direction will be addressed in more detail in chapter 4.

2.7. Data on the public-private composition of educational provision appear in Table 2.4. Up until the early 1980s, more than half of all pre-school enrollments was in private schools, but the private share has dropped dramatically since 1986 with the substantial expansion of government pre-school. In primary education, the private share of enrollments has been relatively stable during the last 10 years at slightly less than 10 percent. This share is more than twice the average of 4 percent among Asian countries.

Table 2.4: Share of enrollments in private institutions, Thailand, 1978-1989

	<u>Preschool</u>	<u>Primary</u>	<u>Secondary</u>	
			<u>General</u>	<u>Vocational</u>
1978	56.6	9.0	22.3	41.0
1980	56.4	8.6	19.2	45.5
1985	40.6	9.0	11.8	43.1
1986	27.4	9.0	10.8	40.9
1987	24.3	9.2	10.4	41.3
1988	21.7	9.5	11.7	41.7
1989	26.1	9.5	10.3	43.0

Source: NEC (1989b).

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<sup>5/</sup> The cohort survival rate to a given grade or in a given cycle of education is defined as the proportion of entrants who survive to that grade or to the end of that cycle.

2.8. At the secondary level, the trends in private provision vary markedly between general and vocational education. Between 1978 and 1985, the private share of general secondary enrollments dropped from 22 percent to 12 percent, a level around which it has hovered since. In contrast, private enrollments in vocational education has maintained a relatively stable share exceeding 40 percent since 1978. Aggregating across the two streams, the average share of private enrollments is currently about 16 percent, somewhat less than the average of about 26 percent among Asian countries.

### II.3 Higher education enrollments

2.9. Higher education is provided through various types of institutions. The Ministry of University Affairs oversees public and private conventional universities and colleges, and the two large-scale open admission/distance institutions, Ramkhamhaeng University (RU) and Sukhothai Thammathirat Open University (STOU). In addition, the Ministry of Education has oversight of teacher colleges; these colleges have degree-granting powers, and traditionally prepare graduates for teaching jobs. Overall, the institutional composition of higher education in Thailand is quite unique among developing countries, notably because the mass system is highly developed, and accounts for a sizable share of students.

2.10. The volume and trend in enrollments among these types of institutions appear in Table 2.5. The aggregate enrollments in conventional institutions under the MOE and MUA taken together have remained relatively stable since 1983. However, there has been a significant drop in enrollments in teacher colleges, in contrast to the rapid expansion in the conventional private institutions, with enrollments nearly doubling between 1983 and 1989. Public conventional universities have also expanded steadily, but at a much slower pace. In the open systems, enrollments also seem to be on the decline. RU enrolled 40 percent fewer students in 1989 than in 1983, while STOU saw enrollments rise from 110,000 in 1983 to a high of 172,000 in 1985 before dropping down again to just over 115,000 in 1989.

Table 2.5: Enrollments in higher education, Thailand, 1983-1989

	Teacher Colleges <sup>a/</sup>	Conventional institutions under MUA			Open admission/distance institutions		
		Public	Private	Total	Ramkhamhaeng	Sukhothai	Total
1983	150,795	101,883	38,686	140,569	546,277	110,448	656,725
1984	141,708	104,958	44,578	149,536	409,686	154,137	563,823
1985	141,659	107,557	46,617	154,174	397,819	172,050	569,869
1986	126,431	113,450	53,135	166,585	397,516	167,937	565,453
1987	107,094	115,892	60,244	176,136	374,700	147,047	521,747
1988	97,701	117,595	60,165	177,760	388,173	135,294	523,467
1989	88,393	123,191	77,001	200,198	343,371	115,688	459,059

<sup>a/</sup> Teacher colleges are administered by the Ministry of Education.

Sources: Data for teacher colleges were provided directly by NEC; for the other institutions, data for 1983-7 were from MUA (1988), while for 1988-89 they were provided directly by MUA.

2.11. What do the above figures mean in terms of the coverage of higher education in Thailand? Simply adding them up across institutions, and dividing the total by the population in the relevant age group, yield what might, for the moment, be interpreted as the enrollment ratio in higher education. The result, of around 27 percent, is more than twice the average enrollment ratio in Asia as a whole, and certainly exceeds the ratios in most countries at Thailand's income level.

2.12. This straightforward computation of the enrollment ratio gives an idea of the reach of the system of higher education in Thailand. It needs to be adjusted, however, for assessing the volume of graduates produced. Usually, the unadjusted enrollment ratio is a good enough indicator, but in the case of Thailand, the large-scale systems are so different in terms of student makeup and student flow that some adjustment of the raw numbers would be appropriate and indeed necessary. In particular, a sizable share of the students in the large-scale systems, mainly in STOU, are employed people seeking not a degree but simply to upgrade their skills. Moreover, a significant number of students in both RU and STOU attend part-time, and so complete their courses over a much longer period than their peers in the conventional institutions. Adjusting for the latter feature is especially desirable, as the result improves the comparability of enrollment data for RU and STOU to those for the other institutions, and facilitate comparing Thailand's enrollment ratios to those of other countries with more conventional systems of higher education.

2.13. Several possible approaches can be used to adjust the enrollment data for RU and STOU. One way starts by noting the pattern of student flow in these institutions. Historical data show that students who graduate take 4 to 8 years to complete their degree, and they represent about 25 percent of the corresponding intake some years back. This pattern suggest that the number of "active" students is much less than the number listed on the institutions' rolls <sup>6/</sup>. An estimate of the "active" population can be derived by applying the 25 percent graduation rate to the total number enrolled. The result is probably more comparable to enrollment data for conventional institutions, but there remains the drawback that differences in length of studies are not standardized.

2.14. An alternative that overcomes this difficulty relies on the ratio of graduates to enrolled population in conventional universities (currently about 0.25). Since the annual output of graduates from RU and STOU (about 20,000 and 15,000 respectively in recent years) is known, the corresponding size of enrollment in a conventional setting can be obtained easily by simple arithmetic: 140,000 (which is the result of  $[20,000+15,000]/0.25$ ).

2.15. Adding this result to the enrollments in the regular universities and teacher colleges (degree courses) gives an adjusted total higher education

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<sup>6/</sup> Ramkhamhaeng University, for example, has some 400,000 students on its rolls in 1989-90, but only 140,000 actually registered for at least one credit of study at the start of the semester, and appeared for the examinations.

enrollment in 1987 of about 423,000, which translates to an enrollment ratio of 11.9 percent l/. This compares to about 10 percent for a country at Thailand's income level, given the relationship observed from cross-country data between per capita GNP and higher education enrollment ratios. If Thailand's economy and population grow respectively at the forecast rates of 6 and 1.8 percent p.a., per capita GNP in 2000 would reach about US\$1,400 (constant 1985 prices). An enrollment ratio in higher education of about 15 percent would be consistent with this income level.

2.16. These comparisons are clearly only suggestive. Averages based on other countries' experience are not sacrosanct, so the comparisons are best understood as indicating possible directions in which future changes might be anticipated. Whether or not higher education should be expanded and how rapidly, depend of course on specific conditions in the Thai labor market and economy. Moreover, how expansion is to be accomplished efficiently and equitably and through what institutional mode are issues that bear further scrutiny. Building on the basic data provided above, these issues are taken up in more detail in chapter 4.

#### II.4 Unit cost estimates

2.17. Estimates of unit costs between 1985-89 appear in table 2.6, based on aggregate public spending and enrollments at the various levels of education (see appendix tables for the breakdown). The budget figures include operating and capital costs; the latter comprise, on average, 15 percent of the total, but no data are available regarding their share at each educational level.

Table 2.6: Unit costs of public education by level, Thailand, 1985-1989  
(Current Bhat/student)

<u>Year</u>	<u>Elementary</u>	<u>Secondary</u>	<u>Technical institutions</u>	<u>Closed universities</u>	<u>Open universities</u>
1985	3,550	4,500	8,980	47,540	390
1986	3,570	4,600	9,020	45,295	416
1987	3,770	4,890	9,230	44,780	450
1988	4,030	5,320	10,180	48,550	470
1989	4,230	5,670	11,325	53,040	600

Sources: BOB, 1985-90; NEC, 1989b; MUA, 1988.

l/ Yet a third approach is simply to relate total graduate output from all types of institutions to the population in the relevant age group. In 1987, the number graduating was 20,922 from closed public universities, 6,558 from private universities, 23,435 from teacher colleges (degree courses), and 36,438 from the open universities, making for a total of 87,353. This corresponds to about 11 percent of the population in the 20-24 age group.

2.18. As is common elsewhere, unit costs rise with level of education. In 1989, they averaged B4,230 for elementary education, B5,670 for general secondary education (averaged over the two subcycles), and B11,325 for secondary vocational education. In higher education, unit costs differ sharply between the conventional and open sectors. Using unadjusted enrollments data, unit costs in the former averaged to B53,040 compared to only B600 in open institutions. These costs are not immediately comparable, however, because of the differences in student flow noted earlier. Converting the number of graduates from the open universities into the equivalent enrollment in conventional settings, and using the result as the denominator in the calculations, the unit costs of open universities are estimated to be about B2,300. While differences in fields of study and emphasis on research vis-a-vis teaching are not taken into account by these aggregate data, the gap between the closed and open sectors remains striking.

2.19. To anticipate subsequent discussion in this report, it is useful to place these data in a comparative perspective (table 2.7). Expressed in units of per capita GNP, Thailand's unit costs exceed the average for Asian countries at all levels of education: by an astonishing 80 percent at the elementary level, 20 percent at the secondary and 15 percent at the higher levels. As will be seen later, the large gap at the first level corresponds to very low pupil-teacher ratios in Thailand compared to the average in Asian countries.

Table 2.7: Unit costs relative to per capita GNP, Thailand and Asia, circa 1985

	<u>Elementary</u>	<u>Secondary</u>	<u>Conventional universities</u>
Thailand	0.18	0.23	2.11
Asia average a/	0.10	0.19	1.83
Indonesia	0.13	0.23	0.91
Korea	0.17	0.23	0.71
Malaysia	0.14	0.21	1.90

a/ Average for 10 countries.  
Source: Tan and Mingat (1989)

2.20. Within higher education, available budget data permit the derivation of unit costs in individual universities. The results (table 2.8) portray wide variation across institutions, ranging among the conventional universities from B132,000 in Mahidol to as low as B13,000 in Srinakharintaraviroj. This wide dispersion stems in part from differences in specializations offered, relative stress between research and teaching, as well as the size of institutions. The precise link between these factors and unit costs is beyond the scope of this report to analyze, but further exploration would be useful to aid decisions about resource allocation. Even

in the absence of such analysis, however, it is doubtful that these factors fully account for the present pattern of unit costs.

Table 2.8: Unit cost of various types of public universities, Thailand 1987 a/

	<u>Enrollment</u>	<u>Budget (mill. Bhat)</u>	<u>Unit Cost (Bhat/student)</u>
<u>Closed universities:</u>			
Chulalongkorn	19,687	1,006.0	51,100
Kasertsart	11,474	363.8	31,700
Khon Keen	6,173	418.7	67,830
Chiangmai	10,822	619.6	57,250
Thammasat	12,812	232.2	18,120
Mahidol	9,213	1,222.7	132,640
Silpakorn	3,671	135.0	36,770
Prince of Songkla	6,850	446.9	65,240
NIDA	1,325	56.6	42,720
Srinakharintaraviroj	21,281	296.5	13,930
Maejo IAT	1,526	43.9	28,770
KMIT Ladkrabang	4,119	117.6	28,550
KMIT Thonburi	2,197	72.8	33,140
KMIT North Bangkok	4,704	84.7	18,000
Total/Average	115,892	5,117.0	44,150
<u>Open universities:</u>			
Ramkhamhaeng			
a) unadjusted enrollments	374,700	159.4	425
b) adjusted enrollments	140,000	159.4	1,140
STOU	147,047	76.6	520

a/ Figures differ slightly from those in table 2.6 since individual institutions' budget do not include Ministry of University Affairs' overheads.

Source: MUA, 1988.

### III. EFFICIENCY AND EQUITY WITHIN THE EDUCATION SECTOR

3.1. The functioning of the education system can be judged on the basis of efficiency and equity. Because these are such broad concepts, it is useful to discuss separately issues that pertain to the arrangements within the sector itself (the subject of this chapter), and those that relate to the sector's interface with the labor market (discussed in the next chapter).

#### III.1 Efficiency in primary and secondary education

3.2. A comprehensive treatment calls for information about levels and mix of school inputs and analysis of their relationship to students' progress in school. This approach is not attempted here, not only to avoid possible duplication of ongoing work on this topic under the BRIDGES project, but also because time constraints on the present study makes it difficult to implement the required analysis. Presented below, instead, are some readily available aggregate indicators which are suggestive of potential sources of improved efficiency in the system. They relate to pupil-teacher ratios, and school and class sizes, all of which have clear implications for the costliness of education.

3.3. (a) Pupil-teacher ratios. To begin from a comparative perspective, data are presented in Table 3.1 on pupil-teacher ratios for Thailand (1970-1985) and other countries in Asia.

Table 3.1: Pupil-teacher ratios in primary and secondary education, Thailand and other Asian countries

	<u>Primary</u>	<u>Secondary</u>
<u>Thailand</u>		
1970	34.7	15.5
1975	28.0	27.2
1980	24.7	-
1985	19.3	19.6
<u>Asia, circa 1985</u>		
Regional avg. a/	33.1	22.6
Indonesia	25.3	15.3
Korea	38.3	34.3
Malaysia	24.1	22.1
Philippines	30.9	32.3
Taiwan	31.7	-

Source: Tan and Mingat (1989)

a/ Reflects data for 14 countries.

3.4. In primary education, the pupil-teacher ratio dropped steadily from close to 35 in 1970 to less than 20 by 1985, a decline exceeding 55 percent. At the secondary level, the ratio rose from 16 to 27 between 1970 and 1975, but then declined to 20 by 1985.

3.5. At both levels of education, Thailand's ratios are significantly below the corresponding averages for Asian countries, as well as those of the selected countries shown in the table. The gap is particularly wide at the primary level, and its significance can be appreciated as follows: keeping all other arrangements unchanged, a rise in the pupil-teacher ratio to the regional average would reduce by about 40 percent the average per-pupil cost of teacher salaries. Since salaries are a major component of overall costs, the corresponding reduction in overall costs is also of the same order of magnitude. In secondary education, a similar calculation shows a smaller reduction in teacher costs per student, by about 13 percent.

3.6. The anticipated cost savings may be illusory, of course, if it is offset by the possible deterioration in learning outcomes associated with larger pupil-teacher ratios (and hence larger class sizes). The issue is clearly an empirical one, depending on the relationship between schooling conditions (among which class size is one factor) and learning outcomes. Some preliminary evidence is presented below relating to primary education. They show that, on balance, raising pupil-teacher ratios at this level is probably efficient in that it can lower unit costs significantly without serious deterioration in learning outcomes.

3.7. (b) Correlates between class size and student achievement. The relationship between schooling conditions and learning outcomes should ideally be estimated from longitudinal data on individual pupils, but such data are not readily accessible. Mobilized instead for the purpose of this study are province-level data on pupil-teacher ratios and student achievement in mathematics and Thai language at the primary level. Estimates based on these data are admittedly flawed due to their high degree of aggregation. However, given the wide variance across provinces in schooling conditions and learning outcomes, the relationship that exists between these variables at the individual level should also emerge from province-level data.

3.8. Before presenting the regression results, two points warrant elaboration. First, besides pupil-teacher ratios, provinces also vary in other characteristics that may affect student achievement. To control for such differences, two additional variables for which province-level data are readily available were included in the regression analysis. These are the mean provincial per capita income, as a summary proxy for economic and social conditions; and provincial population density, to help control for differences for the existence of small schools in sparsely and densely population areas.

3.9. Second, regarding the dependent variable in the regressions, student achievement, the data were averaged over 1985-88 in order to minimize the influence of year-to-year variation. They reflect combined scores in mathematics and Thai language. Taking these subjects together is appropriate because a) the focus here is on student performance in general rather than in specific subjects; and b) the scores in these subjects are highly correlated (Table A3.2 and Figure A3.1).

3.10. The regression results appear in Table 3.2. A striking finding is that in the range of the dataset, class size is not correlated with achievement outcomes, the coefficient on the pupil-teacher variable being

statistically insignificant. This finding is consistent with international evidence based on more careful micro-level studies suggesting that in the range of 15 to 35 pupils, variance in class size has almost no effect on learning outcomes.

**Table 3.2:** Regression results on the correlates of student achievement across provinces in Thailand, late 1980s

	<u>Coefficient</u>	<u>t-statistic</u>
Mean per capita income ( '000 Bhat)	0.05	1.86 *
Mean class size	0.11	0.93
Population/sq. km.	0.002	0.62
R <sup>2</sup>		0.13
N		67

Note: The dependent variable is the average provincial achievement scores in math and Thai language. Data on achievement scores, per capita income, and class size are respectively from ONPEC, 1989; NEC printout, and NSO, 1988; 6 outlier provinces whose achievement scores deviate from the national mean by more than 7.5 percent were excluded.

\* Significant at 7 percent confidence level.

3.11. The regression results indicate that raising the relatively low pupil-teacher ratios and class size that currently characterize Thai primary education is worth considering as an option toward improved efficiency in the use of public resources in the sector. Moving in this direction would require changes in the way schooling is organized, involving such considerations as school consolidation and the use of multi-grade teaching methods 8/. The latter is commonly the more feasible of the two options.

3.12. (c) Some spatial aspects of primary education. Table 3.3 reports the size distribution of primary schools in Thailand, disaggregated by educational region. The prevalence of small schools is striking: for the country as a whole, about one-third of them enroll 120 pupils or less. The share of small schools is especially noticeable in educational regions 6, 7 and 8, where between 14 and 20 percent of the schools currently enroll 60 or fewer pupils.

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8/ In multi-grade teaching, pupils at different grade levels are taught in the same classroom by a single teacher who rotates his/her attention among smaller groups of pupils within the classroom. Under this arrangement, moderately high pupil-teacher ratios can be maintained even in small schools.

**Table 3.3: Size distribution of primary schools in Thailand, 1987**

	# of schools	% of schools with enrollments not exceeding			
		60	80	120	180
Whole Kingdom	31,353	10.0	17.3	34.3	54.9
Region 1	842	2.0	5.5	16.4	36.9
2	1,080	8.8	15.6	28.6	55.2
3	2,440	7.9	12.4	29.6	47.7
4	910	8.1	15.1	31.5	56.7
5	1,853	6.2	13.9	34.5	54.1
6	1,745	14.9	25.4	45.6	68.6
7	3,815	13.5	21.4	40.7	60.9
8	3,848	19.9	31.0	51.5	75.6
9	3,835	9.4	17.3	34.0	50.2
10	4,378	7.4	14.0	30.2	49.3
11	4,535	5.7	10.6	23.3	43.2
12	2,021	8.0	14.8	31.5	57.1

Source: Authors' calculation based on NEC data.

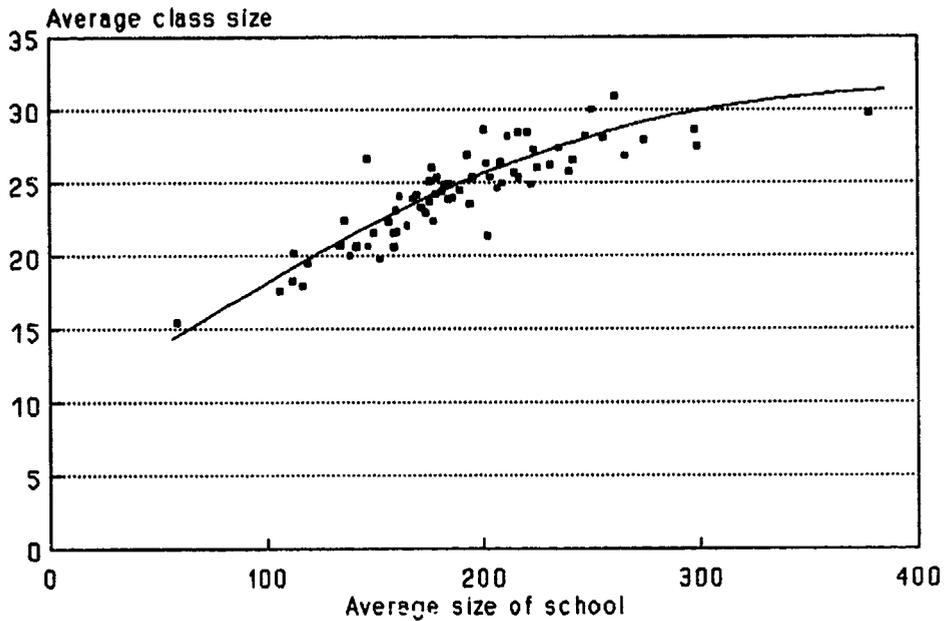
3.13. Small schools are not necessarily inefficient, of course, since overhead costs can be minimized <sup>2/</sup>; and teaching can be organized to make full use of teachers' time. In the Thai setting, however, small schools in fact tend to be inefficient because of the way teaching is currently organized. In particular, most primary schools offer all six grades of instruction without relying on multigrade teaching methods. As a result, small schools tend also to have small classes, and therefore higher unit costs on average.

3.14. Province-level data depict this relationship in Figure 3.1. Up to an average school size of about 200 to 250 pupils, the link between small schools and small classes is clearly positive, but levels off beyond this size. In other words, in the current administrative context of the subsector, economies of scale are present for schools enrolling less than about 200-250 pupils. Given the predominance of small schools indicated in Table 3.3, this pattern provides a first indication that substantial scope indeed exists for improving the efficiency of primary schools in Thailand.

3.15. In practical terms, a variety of possible strategies, not mutually exclusive, can be considered, for example: consolidate the smaller schools into larger ones; introduce multigrade teaching in small schools or in grades with few students; institute alternate year intake in low catchment areas; set up twinning arrangements among nearby schools with low enrollments, so that schools in each set can specialize in different but complementary grades of instruction rather than both covering the full six-year primary cycle; and so on. Actual choices among these options in various settings would obviously need to respond to local conditions and needs.

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<sup>2/</sup> For example, by eliminating certain non-pedagogical services in small schools. This option is not examined in detail here because overheads are typically only a small part of costs at the primary level. Also, the relevant data are lacking.



**Figure 3.1:** Province-level correlation between average size of primary schools and average size of classes, Thailand, 1987

3.16. Multi-grade teaching is a common option in many countries. In France, for example, it is used in about one-third of all primary schools in the country. Its popularity arises because it can help to lower the costs of small schools, thereby reducing the financial pressure for closure, often a politically unpalatable option.

3.17. Besides its economic advantage, multi-grade teaching is also pedagogically sound. One reason is that in multi-grade classes, the teacher is to some extent forced to recognize the heterogeneity among his/her pupils (a fact that is explicitly acknowledged in the label attached to the class), and therefore to customize instruction accordingly. In single-grade classes, on the other hand, homogeneity among pupils is often an implicit assumption, so instruction tends to be delivered in a uniform manner, even though a more varied approach may better match the needs of individual pupils.

3.18. Because of these differences, teachers in multi-grade classes have an arguably heavier and more difficult workload. For this reason, increased compensation for such teachers would be appropriate, and indeed, warranted. The cost savings from an increase in pupil-teacher ratios made possible by the use of multi-grade teaching are probably large enough to absorb an increase in teacher compensation and still produce net cost savings for the system. For

example, in the Thai context, if pupil-teachers were raised from 19 to 25 through the use of multi-grade teaching, unit costs would drop by 24 percent, part of which can be used to provide a non-trivial increase in pay for teachers in multi-grade classes.

3.19. With regard to school mergers as an option to lower costs, they are often politically unpopular, but should not be ruled out completely. In primary education, an important constraint is that pupils are typically too young to travel far on their own. For this reason, most governments, including Thailand's, have sought to locate schools close to pupils' homes in the drive to universalize enrollments. In sparsely-populated areas, small schools inevitably result.

3.20. With due regard for the equity considerations, is there nevertheless scope for mergers of the smallest schools? Provincial data provide some preliminary evidence in this regard. Regressions analysis shows that in the Thai context, small schools are indeed more prevalent in provinces with low population densities. The relationship is quite loose, however, with wide variation around this average pattern (Figure 3.2). It may well be that the observed spatial distribution reflects arrangements that take into account differences in topography. Even granting this possibility, however, the very wide disparities across provinces suggest that sizable scope probably exists for rationalizing the current spatial distribution of schools. As an option to improve efficiency in primary schooling, it probably bears further examination.

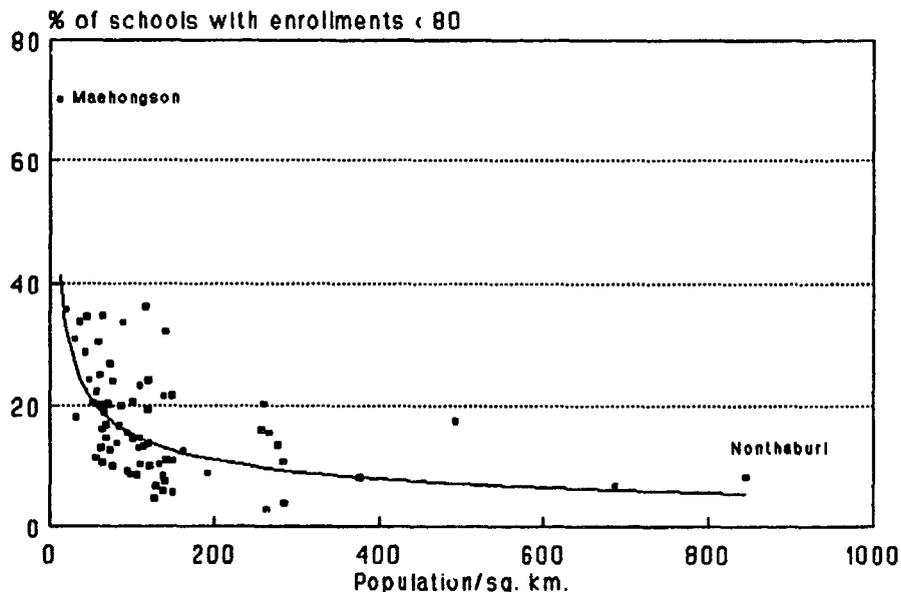


Figure 3.2: Provincial population densities and share of small schools, Thailand, 1987

3.21. (d) Improved spatial arrangements and the demand for primary school teachers. Projections indicate that the population aged 6-11 years is expected to stabilize and even shrink slightly between now and the end of the decade. The demand for additional primary school teachers is thus not likely to increase; if primary education is spatially reorganized for greater efficiency along the lines discussed above, a surplus of primary teachers would in fact emerge.

3.22. For a sense of the orders of magnitude involved, consider the projections shown in Table 3.4. The latest year for which actual data are available is 1987: the number of public primary school teachers and pupils in that year were, respectively, 360,203 and 7,274,150; the population aged 6-11 was 7,536,998, implying an enrollment ratio of 97 percent. For projections into the future, to say 1995, it is assumed that the net attrition rate among teachers is -2 percent p.a., that is retirees outnumber new entrants to the teaching force. This is, if anything, probably a conservative assumption, since historical data show the teaching force increasing modestly (by about 3 percent p.a. between 1980 and 1985); it is, nevertheless an appropriate assumption for a mature education system. The school-age population is projected to shrink at -0.2 percent p.a. between 1987 and 2000; and it is assumed that by 1995, the enrollment ratio would be 100 percent.

Table 3.4: Projected surplus of primary school teachers, Thailand 1995

Initial conditions in 1987

Population aged 6-11	7,536,998
Enrollment ratio (%)	97
No. of pupils	7,274,150
No. of teachers	360,203
Pupil-teacher ratio	20.2

Assumptions:

Net attrition rate among primary school teachers	-2.00 % p.a.
Growth rate of 6-11 population	-0.20 % p.a.
Primary enrollment ratio (%)	100

Projection to 1995:

No. of pupils	7,432,215
No. of teachers	313,145

Surplus teachers in 1995:

(a) If pupil-teacher ratio rises to 25	15,856
(b) If pupil-teacher ratio rises to 30	65,404

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Source: Authors' estimates.

3.23. Under the above assumptions, the results indicate that if the spatial organization of primary schooling were rationalized to permit raising the average pupil-teacher ratio from its current value of 20 to 25, the number of surplus teachers would be around 16,000; if the system moves more drastically toward a pupil-teacher ratio of 30, the surplus would reach

65,000. It may be argued that these are lower bounds, given the net attrition rate assumed. With a lower net attrition rate, say -1 percent p.a., the corresponding surplus would have been 35,000 and 85,000 respectively.

3.24. These numbers are sizable, but in the current Thai context, the potential surplus is not necessarily a problem, and may in fact facilitate expansion of preschool and lower secondary education. With the anticipated tightening of the labor market, particularly with respect to educated workers, the demand for teachers at these levels may be difficult to satisfy. The difficulty can be mitigated if surplus primary school teachers were redeployed. Such a transfer can be accomplished through a program of in-service training. For those who will move to other levels, new teaching skills and subject knowledge would obviously be needed; for those who remain in primary schools, training in multigrade teaching, and in the handling larger classes might also be appropriate.

### III.2 Efficiency within higher education

3.25. As before, a preliminary gauge of the scope for enhanced efficiency within the subsector is provided by broad aggregate comparative data. Table 3.5 shows how Thailand compares to other Asian countries in terms of student-faculty ratios at this level of education. In the public conventional institutions, the ratio is significantly lower than those in other countries: for example, Malaysia's ratio, which is at the lower end among Asian countries, is nearly 40 percent greater than Thailand's. The difference is sufficiently large to imply substantial potential for cost-savings.

Table 3.5: Student-faculty ratios in higher education, Thailand and other Asian countries, mid-1980s

	<u>Regular institutions</u>		<u>Open/distance education</u>
	<u>Public</u>	<u>Private</u>	
Thailand	8.3	17.6	618.8
Asian countries			
Regional average a/	13.9	-	-
Indonesia	14.0	46.1	689.7
Korea	42.2	41.1	414.7
Malaysia	11.4	-	-
Philippines	16.0	48.0	-

Source: Tan and Mingat (1989)

a/ Based on data for 14 countries.

3.26. It is noteworthy too that although the student-faculty ratio in private institutions is about twice the average in public institutions, it remains smaller than the ratios characterizing private institutions in other Asian countries. This feature results from a combination of several possible influences. One factor is the predominant role of Thailand's high-volume distance/open systems which precludes private institutions from locating

toward this end of the higher education market where student-faculty ratios are by definition larger. At the same time, the heavy demand for high-quality, faculty-intensive higher education is satisfied only partially by the small-capacity public universities. The resulting excess demand thus generates a market at the high "quality" end for private institutions to satisfy. However, being dependent on student fees for the bulk of recurrent income and thus more cost-conscious, the private sector is observed to operate with larger student-faculty ratios than the public institutions 10/

3.27. The pattern of student flow is also relevant to consider in assessing internal efficiency in the system. A summary statistic in this regard is the ratio of graduates to the enrolled population. For the conventional institutions, this statistic is around 25 percent; if higher education lasts four years, it implies that almost all entrants finish the course, and do so without repeating. In contrast, the lower figures for private institutions and the open/distance systems suggest that dropping out is much more prevalent in them. This comparison does not necessarily imply lower efficiency in the latter groups, since differences in inputs are not taken into account.

3.28. One way to incorporate such differences is to relate the production of graduates to staff resources (which are a big component of input cost), an aggregate indicator being the ratio of graduates to faculty. The most striking difference in this ratio is between the conventional institutions (both public and private) on the one hand, and the distance/open systems on the other (Table 3.6). Not surprisingly, conventional universities are many times more resource-intensive in their production of graduates than the distance/open universities, a pattern that is probably reflective of differences in course offerings. Between public and private conventional institutions, the gap remains significant however, and is suggestive of possible differences in internal efficiency.

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10/ This leaning toward higher student-faculty ratios is partly restrained, however, by government regulations. While the regulations aim at safeguarding standards, overly restrictive controls, particularly in the form of requirements that mimic those applied to public institutions, can have the perverse effects of preventing the private sector from operating efficiently, and limiting its role in widening educational options for what is likely to be an increasingly diverse student population in a rapidly evolving labor market. Although the data at hand do not permit firm conclusions to be drawn, the impact of current regulations of private institutions warrants further evaluation.

Table 3.6: Graduate output from various types of higher education in Thailand, 1980s

	<u>Conventional institutions</u>		<u>Open/distance</u>
	<u>Public</u>	<u>Private</u>	<u>institutions</u>
Student-staff ratio	8.1	17.6	744.5
Graduates per 100 enrolled students	25.8	17.2	5.0
Graduates-staff ratio	2.1	3.0	37.3

Source: Tan and Mingat (1989)

3.29. The tentativeness of these results is to be stressed. An important reason is that the lower costs in the distance/open systems and private institutions could well be negated if their graduates perform more poorly on the labor market. Clearly, cheapness in itself is a dubious advantage if these institutions produce graduates who lack the knowledge and skills to function in their subsequent jobs. Comparison in this regard is presented in the next chapter, in the context of broader discussion about the education system's linkage to the larger economy. Suffice it here to note that on the basis of the broad aggregate indicators cited above, there is some basis to believe that costs can probably be lowered in the public conventional institutions; and that despite their relatively weak student flow pattern, the distance/open systems might well be a relatively economic source of higher education graduates in some fields.

### III.3 Equity within the education system

3.30. (a) Structure. The shape of the enrollment pyramid reflects one dimension of structural equity as it corresponds to access to education at the various levels, and determines the distribution of educational attainment among members of a generation. Public spending per student is a second structural dimension of equity because it affects the distribution of resources in the sector. The relevant data in these respects for Thailand and other Asian countries appear in Table 3.7 <sup>11/</sup>. To facilitate interpretation and comparison, the data are consolidated into a single summary

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<sup>11/</sup> Note that in order to retain comparability across countries, the data for Thailand are drawn from the same source as for the other countries. As a result, they do not match exactly those reported in table 2.3. Moreover, the enrollment ratio of 19.6 percent in higher education is retained here, since the focus is more on access than on the production of graduates; it also corresponds more closely to the unadjusted unit costs data used here.

indicator of structural equity--namely the share of cumulative public spending captured by the best educated decile in a generation (column 7) <sup>12/</sup>.

**Table 3.7:** Structural equity of the education system in Thailand and other Asian countries, circa mid-1980s

	<u>Enrollments ratios (%)</u>			<u>Average public spending per pupil as % of per capita GNP b/</u>			<u>% of cumulative public spending received by best educated 10%</u>
	<u>Primary</u>	<u>Secondary</u>	<u>Higher</u>	<u>Primary</u>	<u>Secondary</u>	<u>Higher</u>	
Thailand	97	30	19.6	15.5	15.3	39.9	23.4
<b>Asia</b>							
Regional average a/				10.1	19.0	153.0	36.9
Indonesia	118	42	6.5	12.6	23.3	91.1	21.1
Korea	99	74	31.6	16.5	23.4	70.6	13.3
Malaysia	99	53	6.0	14.1	21.3	190.3	32.1
Philippines	106	65	38.0	5.8	8.6	50.0	14.1

a/ Reflects data for 10 Asian countries.

b/ This variable differs from unit costs, reflecting public spending at each level divided by total enrollments, including those in the private sector. It is appropriate here since the concern is with the aggregate longitudinal distribution of spending according to education attainment.

3.31. The best educated decile in almost every country receive more than their population share of the cumulative public spending on education. However, their share in Thailand is significantly smaller than the regional average, consistent with the country's generally broad-based education system. The Philippines and Korea perform even better, however, suggesting that scope for improvement exists in the Thai system. In these two countries the result reflects the strong presence of largely self-financing private higher education, and the fact that fees for public higher education are set to recover a substantial share of costs--as much as 46 percent in the case of Korea.

3.32. The Thai result, in contrast, owes much to the presence of RU and STOU, which are responsible for the relatively high overall enrollment ratios and low unit costs of higher education. At this level of aggregation, the disparities within higher education--in terms of rates of cost recovery and unit costs--between the conventional public institutions on one hand, and RU and STOU on the other are obviously suppressed. However, it is unlikely that

<sup>12/</sup> See Mingat and Tan (1985) for elaboration of the method of derivation. The summary statistic is obviously only a rough indicator, being based on aggregate data on enrollment ratios and unit costs obtained from published sources. It nevertheless offers sufficient basis for gauging the overall structural equity of an education system.

a more refined calculation would reverse the finding that Thailand's system of education is fairly equitable in its global structure of access and public spending.

3.33. (b) Social selectivity. The system fares less well in terms of social selectivity, however. Disparities are especially evident in the pattern of transition from primary to secondary education, and within higher education, in the selection into closed and open/distance institutions. Male-female differences are relatively modest, but significant gaps exist according to geographic location and among socioeconomic population groups.

3.34. (i) Urban-rural disparities in school participation rates exist at all levels (Table 3.8). In the youngest age group (3-5 year olds), children in municipal areas are nearly 3 times as likely to be attending school as their non-municipal counterparts. Preschool education is obviously an urban phenomenon. Primary education--corresponding to age range 6-11--is compulsory in Thailand <sup>13/</sup>, but attendance is not universal in both urban and rural areas. Urban children are nevertheless about 1.13 times as likely to attend as rural children. In the absence of compulsion in subsequent age groups, the gap widens progressively.

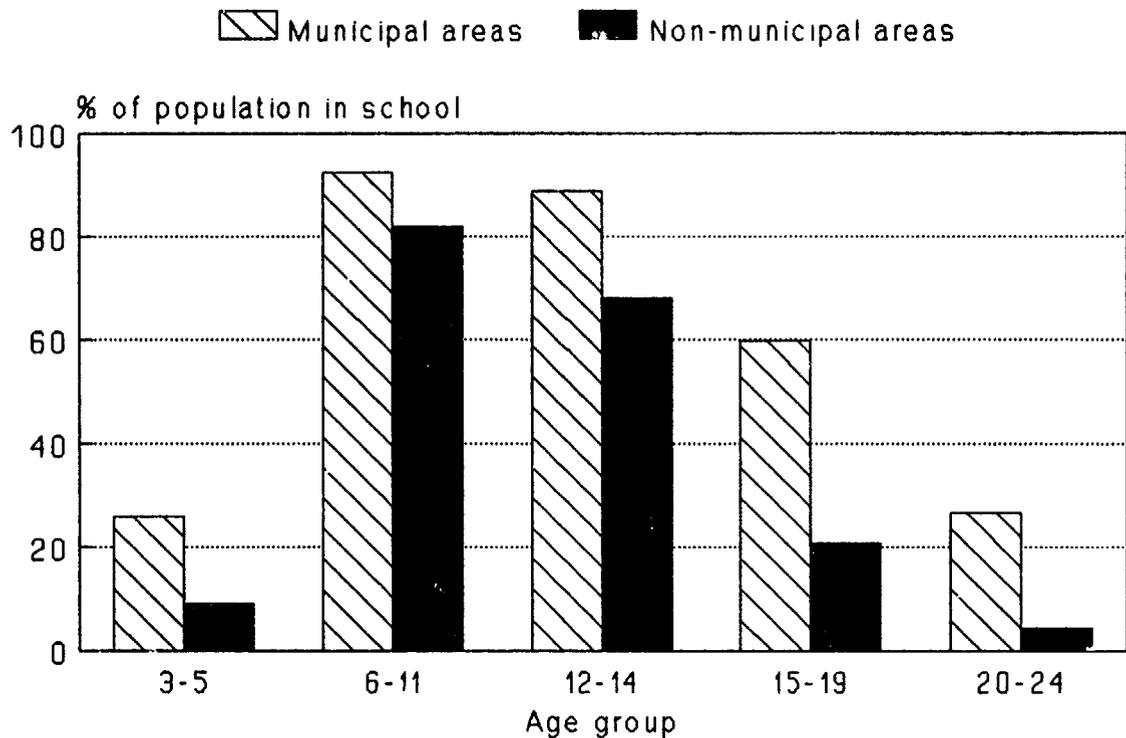
Table 3.8: Percentage of population attending school by age group, Thailand, 1985

Age group	Municipal Areas			Non-Municipal Areas			Ratio (3)/(6)
	Male (1)	Female (2)	Average (3)	Male (4)	Female (5)	Average (6)	
3 - 5	25.7	25.9	25.8	9.1	8.8	9.0	2.88
6 - 11	92.0	92.7	92.4	81.2	82.6	81.9	1.13
12 - 14	92.4	85.0	88.7	69.1	66.8	68.0	1.31
15 - 19	64.6	54.8	59.7	21.9	19.2	20.6	2.91
20 - 24	29.9	23.0	26.5	3.9	4.6	4.3	6.22

Source: NSO, 1987b.

3.35. Among the oldest population in the sample, corresponding to post-secondary education, male municipal residents report an attendance rate nearly 8 times as high as that of their non-municipal counterparts. Since most post-secondary institutions in Thailand are located in the cities, part of this gap probably reflects migration effects rather than actual differences. Nevertheless, given the disparities at the earlier ages, access to places in higher education is probably strongly biased in favor of the urban population. For illustration, the rate of school attendance by age group and residence is plotted in Figure 3.3.

<sup>13/</sup> In 1990, the government announced the extension of compulsory education from six years to nine years.



**Figure 3.3:** School participation rates in municipal and non-municipal areas, Thailand, 1985

3.36. (ii) Disparities in survival rates are a major source of the gaps revealed above 14/. The pattern by educational region appear in Table 3.9. For the country as a whole, just over 80 percent of grade 1 entrants reach the end of the six-year primary cycle 15/. While this outcome is better than the Asian average of around 60 percent, it lags behind such countries as Korea and Malaysia, where survival rates are close to 100 percent. There are obvious gaps among regions, but the survival rate in region 2 is particularly low, being only 56 percent compared to rates exceeding 70 percent in all other regions.

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14/ It is unclear what proportion of children in Thailand do not enter the first grade. What is clear is that attendance rates among 7 and 8 year-olds are respectively only 93 and 91 percent between 1985-1987. This result suggests that access to and retention in the first grade are possible problems accounting for non-universal coverage in primary education.

15/ The survival patterns are estimated from data on enrollments by grade in three successive years. They assume for simplicity that entry into grade 1 is universal.

**Table 3.9: Percent of grade 1 entrants surviving to selected points in the education system, Thailand, late 1980s**

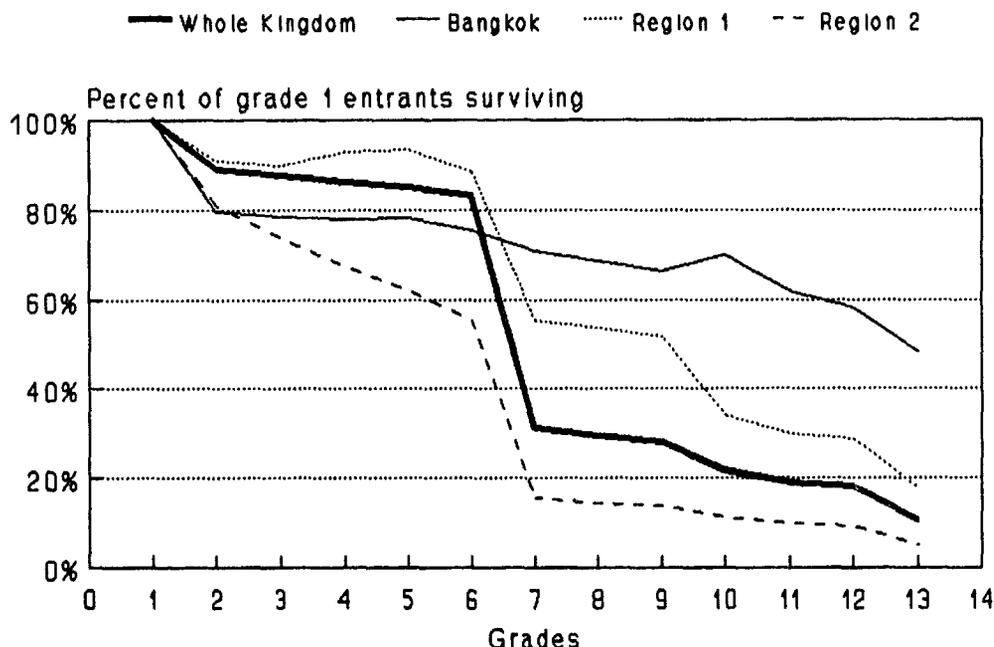
	<u>Gr.6</u>	<u>Gr.7</u>	<u>Gr.9</u>	<u>Gr.10</u>	<u>Gr.12</u>
Whole Kingdom	83	31	28	22	19
Bangkok	75	71	66	70	58
Region 1	88	55	52	34	29
2	56	16	14	11	9
3	83	39	34	24	19
4	74	31	28	21	17
5	92	36	33	23	25
6	84	41	37	28	23
7	91	26	24	18	15
8	77	31	29	19	12
9	100	23	21	15	14
10	88	21	18	12	10
11	76	17	15	10	8
12	81	34	31	22	18

Source: calculated from NEC data on enrollments by grade between 1985 and 1989.

3.37. In terms of overall survival patterns, the transition from grade 6 (end of primary) to grade 7 (start of lower secondary) represents a major selection point <sup>16/</sup>, with barely 40 percent of the eligible population nationwide remaining in the schooling system past it. However, Bangkok comes out far ahead of the other regions, with a transition rate of nearly 100 percent. Its status as the leader is maintained at all major subsequent transition points in the system, so that nearly half of its grade 1 entrants eventually survive to the first year of higher education, compared to 11 percent for the country as a whole, and no more than 5 percent in three of the poorest regions (2, 10 and 11). Region 1 has the second best results, but with a survival rate of only 18 percent, it hardly matches Bangkok's advantage. Figure 3.4 shows the disparities among the better- and worse-performing educational regions, and highlights the large gap between the capital city and the rest of the country.

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<sup>16/</sup> The term selection includes selection by the school system, as well as self-selection by students. Thus, no distinction is made between voluntary exit from the system and non-admission by school administrators.



**Figure 3.4:** Percent of grade 1 entrants surviving to successive grades, selected educational regions, Thailand, late 1980s

3.38. (iii) Correlates of transition rates between grades 6 and 7. As indicated above, this is a critical transition point at which wide differences emerge across regions and provinces. Since the country has an obvious interest in raising overall primary-to-secondary school transition rates, while at the same time ameliorating regional differences, it is of some importance to examine the factors that underlie the existing patterns of transition.

3.39. From a policy perspective, a basic issue is to evaluate the extent to which low transition rates are due to poor schooling conditions in primary education (which affect learning outcomes, and therefore the ability to continue) and the extent to which they result from a weak private demand for secondary schooling. The choice of policies to enhance transition rates depends crucially on the relative importance of these two sets of factors. If low rates of transition are due mostly to the first set of reasons, the appropriate intervention would be to improve educational quality in primary education. On the other hand, if they stem from weak demand, other policy levers would obviously need to be considered. Beyond this step in the analysis, further work would be warranted for a more precise assessment of the most efficient options.

3.40. Ideally, individual survey data should be used for the analysis. However, in the context of the present study, readily available province-level data were used instead to provide some early results. In the regressions reported in Table 3.10, the dependent variable is the provincial transition rate between grades 6 and 7, while the independent variables are the provincial average level of achievement in grade 6 (in mathematics and Thai language; see paras. 3.7 and 3.8 above), and provincial average per capita income. The latter variable is adopted as a proxy for the strength of private demand (which is not directly measurable).

**Table 3.10:** Correlates of provincial transition rates between grades 6 and 7, Thailand, late 1980s

	Mean	S.D.	Regression coefficients		
			(I)	(II)	(III)
Transition rate between grades 6 and 7	0.38	0.15	-	-	-
Average provincial income (1000 Bh./year)	19.1	15.5	0.006** (7.13)	0.007** (7.75)	-
Deviation of grade 6 achievement score from national mean	0.09	4.21	0.006* (1.84)	-	0.013** (3.03)
Constant	-	-	0.26 (12.54)	0.26 (2.28)	0.38 (2.70)
R-squared	-	-	0.47	0.46	0.11
No. of observations	73	73	73	73	73

Note: \*\* indicates the coefficient is statistically significant at 5% confidence level;  
\* indicates it is significant at the 15% level.

3.41. In equation I, the coefficients on both the income and achievement variables have the expected signs and are statistically significant at the 5 and 15 percent confidence levels respectively. Transition rates appear to be more strongly associated with the income variable: a one-standard deviation rise in income around the sample mean implies a 24 percent increase in the mean transition rate, but a one-standard deviation improvement in achievement is associated with an increase of only 7 percent in the mean transition rate.

3.42. Equations II and III show the results in which income and achievement are regressed separately on the dependent variable. The stability of the R-squared value between equations I and II, and its sharp decline in equation II suggest that the effect of income working through the achievement variable is limited. Income is modestly related to achievement, and has a separate and independent association with transition patterns.

3.43. For illustration, the relatively weak role of achievement as a factor in the selection of students for secondary education is portrayed in

Figure 3.5. Provinces such as Narathiwat and Yala report comparably low achievement results, but differ markedly in terms of the transition rate between grades 6 and 7. Similarly, Nakhonpathom and Nakhonphanom have comparably good achievement results, but differ substantially in transition rates <sup>17/</sup>.

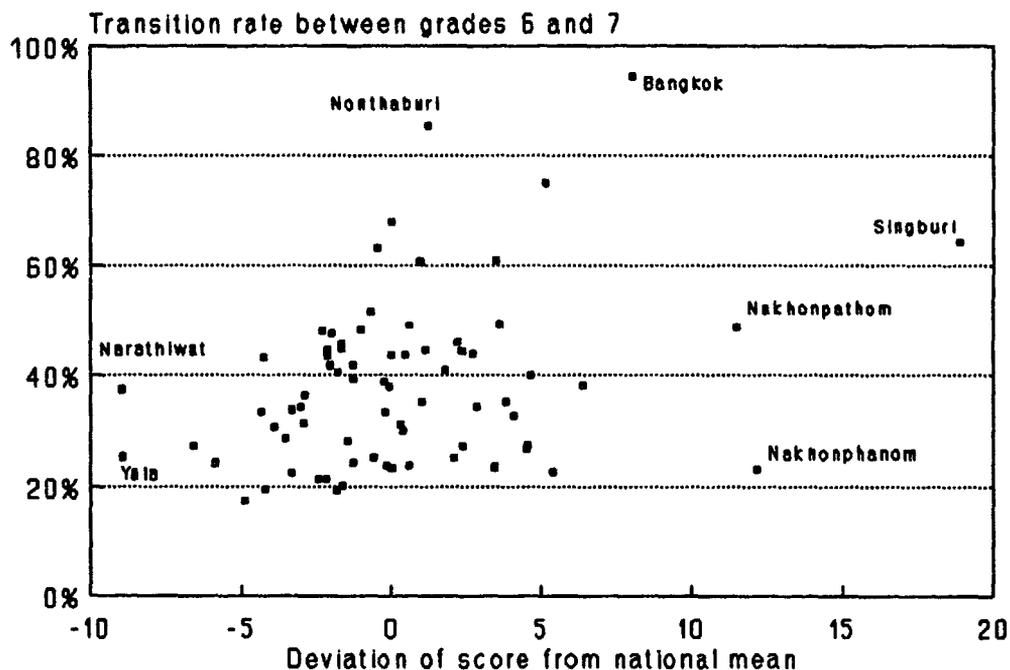


Figure 3.5: Provincial pattern of grade 6 achievement and transition rate between grades 6 and 7, Thailand, late 1980s

3.44. (iv) Social selectivity at post-primary levels of education. Since a large majority of the population survive to grade 6, but less than half beyond this grade, it is no surprise that wide cleavages among

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<sup>17/</sup> Note that to the extent that academic progress depends on pupils' preparation in previous grades, the weak link between achievement and transition rates implies an inefficient selection outcome. It is moreover an inequitable outcome given the clear bias against lower-income groups.

socioeconomic groups first emerge at this point in the education system 18/. Subsequent selection remains heavily biased against lower socioeconomic groups.

3.45. Table 3.11 shows data relating to the student composition in upper secondary level. The degree of bias can be assessed by comparing a group's share of enrollments to its share of the overall population. The professional groups's share of enrollments is 25 percent compared to their population share of only 3 percent. On the other hand, farmers' share of enrollments is 20 percent compared to their population share of 69 percent. The other social groups' access to upper secondary education also exceeds that of the farmer group, but by a smaller margin.

Table 3.11: Social selectivity in secondary education in Thailand, 1985 a/

Socio-economic group a/	Population distribution (%)		Ratio of enrollment to population shares	Selectivity Index b/ (Farmers = 1.0)
	Overall	Secondary education		
Professional	3.1	25.1	8.1	27.0
Business	9.0	19.1	2.1	7.0
Laborer	19.4	35.6	1.8	6.0
Farmer	68.5	20.2	0.3	1.0
All groups	100	100		

Source: authors' estimates based on NEC, 1989a.

a/ Defined according to the occupation of students' fathers.

b/ Calculated from the preceding column by dividing by the figure for the farmer group.

3.46. To render the comparison more transparent, an index of selectivity can be computed by dividing the ratio of the enrollment and population share for each group (column 4) by that for the farmer group (same column, last row). The result (column 6) can be interpreted as the probability that a child from a given social group enters upper secondary school relative to that of a farmer's child. For example, professionals' children have a relative entry probability 27 times as high as that of farmers' children. Among the children of businessmen and laborers, the corresponding probability is respectively 7 and 6 times that of farmers' children.

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18/ Note that since 20 percent of the grade 1 population do not survive the primary cycle, the problem probably arises much earlier in the system for those from the weakest socioeconomic groups, possibly as early as the first and second grades, where dropping out appears to be particularly sharp.

3.47. That selectivity is reinforced in the transition to higher education is evident from the data in Table 3.12. The probability that a child of professional parents enters one of the closed universities is over 50 times that of a farmer's child; the corresponding ratio is over 30 times in the case of a businessman's child. Noteworthy is that while laborers' children have an equal probability of entering upper secondary education as the children of businessmen, their probability of entering closed universities is very much diminished. They are on an equal footing mainly in the access to the open system. It is also of interest that the student composition in the highly subsidized public universities differs little from that in fee-charging private universities. Both systems thus serve the same clientele, namely upper income groups. In contrast, the lower SES groups are better represented in Sukhothai, but even so, children from farming families remain significantly under-represented.

**Table 3.12: Social selectivity in higher education, Thailand 1985**

Socioeconomic group a/	Population distribution (%)				Ratio of enrollment to population shares			Selectivity index b/ (Farmers = 1.0)		
	<u>Conventional institutions</u>				<u>Public</u>	<u>Private</u>	<u>STOU</u>	<u>Public</u>	<u>Private</u>	<u>STOU</u>
	<u>Overall</u>	<u>Public</u>	<u>Private</u>	<u>STOU a/</u>						
Professional	3.1	27.4	24.6	15.9	8.8	7.9	5.1	54.1	51.8	10.7
Business	9.0	45.4	52.3	20.9	5.0	5.8	2.3	30.9	37.9	4.8
Laborer	19.4	16	12.6	30.4	0.8	0.6	1.6	5.0	4.2	3.3
Farmer	68.5	11.2	10.5	32.8	0.2	0.2	0.5	1.0	1.0	1.0
All groups	100	100	100	100	-	-	-	-	-	-
Parental income c/ (Bhats per month)	2,380	11,197	15,477	-	-	-	-	-	-	-

a/ Sukhothai Thammathirat Open University.

b/ See text and Table 3.11 for definition.

c/ Data in the first column refer to average earnings of working adults.

Source: authors' estimates based on NEC, 1989a.

### III.4 Options to lessen social selectivity in education

3.48. To the extent that a reduction in social selectivity is desirable, the issue turns on identifying appropriate policy options. A detailed examination is beyond the scope of this study, but preliminary discussion about broad directions is both feasible and worthwhile here.

3.49. A first step is to decide on the focus of public policy: given the sector's current characteristics and arrangements, where in the education system does it appear that public intervention would have the largest potential for reducing overall system-wide social selectivity? What other

complementary actions might be warranted to address related issues in specific parts of the system?

3.50. In answer to the first question, the evidence suggests that a priority is to focus attention on the transition from primary to lower secondary education, i.e. between grades 6 and 7. Of lesser, though still high, priority is complementary action to improve survival rates within primary education, the reason being that a sizable group, comprising as much as 20 percent of each school-age cohort, currently do not complete the cycle, and these children are likely to come from the more socially disadvantaged families. Policies to reduce disparities in the access to higher education might also be considered, although their impact would obviously be limited to the upper end of the educational ladder.

3.51. Beyond these broad directions, there remains the task of finding solutions to the problems identified. This clearly more difficult job is beyond the scope of the present study, but something can be said about what needs to be done by way of analysis. First, to address survival problems in primary education calls for an assessment of the cost-effectiveness of alternative interventions in different geographic and socioeconomic settings, using longitudinal data that allow school participation behavior to be traced over time. With regard to reducing selectivity within higher education, a system of student financing through scholarships and loans (such as the scheme proposed by the National Teacher Board) is in theory an attractive possibility. There is, however, limited experience thus far with this instrument in Thailand, so its potential and design would need to be assessed through experimentation.

3.52. On the transition between grades 6 and 7, some might argue that the government's recently-announced decision to extend compulsory education by three years beyond grade 6 renders irrelevant discussions about interventions to lessen social selectivity at this point in the system. In a technical sense, this conclusion is correct, but compliance with the new legislation is likely to take time, and may remain incomplete <sup>19/</sup>. With compulsory lower secondary education, school fees will presumably be eliminated, which will encourage greater demand. However, fees comprise only one-fourth of a student's total out-of-pocket costs in public schools (Table 3.13), so its elimination may have little impact, particularly among lower-income groups.

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<sup>19/</sup> The experience with compulsory education at the primary level suggests that compliance will be slow to catch up with the new legislation.

**Table 3.13:** The private direct costs of lower secondary schooling in Thailand, 1987  
(Bhats per year per pupil)

	<u>Public school</u>	<u>Private school</u>
Fees	621	1,813
Books & other materials	428	520
Uniforms	520	583
Transportation	852	1,656
Other costs	149	138
<b>Total</b>	<b>2,570</b>	<b>4,710</b>

Source: NSO, 1987b.

3.53. To reinforce the overall framework of compulsory lower secondary education additional supporting intervention is probably also needed. Given the strong correlation between the income variable and transition rates, these interventions would need to promote incentives for continuation to lower secondary education, targeted toward lower-income groups <sup>20/</sup>. This option appears promising in view of the reasons most cited by young people for not attending school (Table 3.14). Among 12-14 year-old youths not in school, the lack of financial support is by far the most important factor. Direct education costs are prohibitive, but for some forgone earnings probably pose an additional obstacle: fully one-third of this population actually work for an income, and nearly a fifth are employed as unpaid family labor.

3.54. These patterns suggest that for some of the targeted population, financial assistance might need also to cover lost earnings or some part thereof. The fact that limited experience exists with such intervention suggests that it might be prudent initially to experiment with alternative arrangements. Geographically, such a pilot effort might be located in provinces which currently have good academic outcomes, but relatively poor transition rates (in Figure 3.5, these provinces would be in the lower right quadrant).

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<sup>20/</sup> Improving the academic achievement of children from lower-income groups is also an option, since this might improve their capacity to continue in the system. However, the link between transition rates and achievement is weak whereas it is strong with income--a result admittedly based on province-level data--suggests that economic rather than academic reasons are currently the main obstacle to better transition outcomes among students from poorer backgrounds.

**Table 3.14:** Distribution by selected characteristics of out-of-school youth aged 12-14, Thailand, 1987

<u>Reason for not attending school (%)</u>	<u>Municipal areas</u>	<u>Non-municipal areas</u>
<u>Economic factors</u>		
No financial support	75.1	69.3
Have to earn livelihood	4.2	9.7
Distance to school	0.5	3.2
<u>Other factors</u>		
Sickness	3.5	2.3
No interest in studying	10.6	11.2
Could not be admitted	-	0.9
Other reasons	6.1	3.4
<u>Activity while out of school (%)</u>		
Working	33.3	38.1
Unpaid family worker	18.6	38.0
Looking for work	1.1	1.0
Housework	23.9	17.7
Non-economic activity	18.6	6.9
Other	4.4	1.5

Source: NSO, 1987b.

3.55. At the post-secondary level, equity would be enhanced mainly by improving access through a restructuring of the arrangements for student finance. At present, only token fees are charged at conventional public universities, in contrast to full or nearly full cost recovery practices in the private sector. Since little difference exists between these two types of institutions in terms of students' social background, the present system effectively provides heavy to a select group of people who clearly can afford to pay much more. As will be apparent from discussion in the next chapter, the introduction of a package of changes, consisting of substantially increased fees coupled with a scholarship-cum-loan scheme would be more equitable, while also enhancing the system's capacity to expand on a sustainable basis in response to the growing demand for well-educated workers.

#### IV. LABOR MARKET PERSPECTIVES ON EDUCATIONAL EFFICIENCY AND EQUITY

4.1. Apart from the education system's internal organization and operation, education planners are equally concerned about its linkage to the labor market. Since school leavers are ultimately destined for employment, a basic issue is the match, in volume and type, between the education system's output, and the demand for educated labor. This problem involves two main steps of analysis: a) assessing what would be externally efficient for the education system to produce; and b) formulating "activities" or operations to reach the desired output goals. In the latter step, equity is an important criterion for the choice among alternative strategies.

##### IV.1 Assessing the education system's future output objectives

4.2. Two approaches are commonly used in this exercise: manpower forecasting and rate-of-return analysis 21/. The latter is adopted here since it presents, in the authors' view, a more flexible and reliable guide for educational planning. To be more comprehensive, the analysis also includes an assessment of some relevant labor market signals, such as unemployment and job vacancy rates. Given the major shifts currently underway in Thailand's economy (see chapter 1) and the buoyancy to be expected in it, this item in the analysis is particularly important as it helps to track recent labor market developments that are not easily captured in rate-of-return estimates 22/.

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21/ The former involves forecasting future sectoral outputs to which employment-output and employment-education coefficients are applied to determine the "required" output from the education system. The latter relies on labor market data to compute rates of return to the different levels and types of education. The results provide a basis for decisions about directions in which to expand the system without specifying the long- to medium-term quantitative targets. Manpower forecasting is highly attractive, given its forward-looking orientation and explicit link to economic projections, but experience with it has been discouraging: forecasts are usually not reliable beyond a horizon of a few years, and when disaggregated by types or levels of jobs and education. For this reason, detractors argue instead in favor of continuous assessment of the labor market--including rate-of-return analysis--to develop a rolling plan for educational investments.

22/ Estimating rates of return and tracking labor market signals are the two main elements involved in a broadly-defined rate-of-return approach to assessing investment options in education. In all settings, continuous monitoring of the labor market via these indicators is indispensable if the education sector is to be developed in a manner that responds efficiently to the external economic stimuli.

4.3. (a) Patterns of returns to education. A first approximation is provided by regression estimates of the Mincerian earnings functions. The results are based on data from the 1986 Labor Force Survey (round 3), a nationally representative survey conducted by the National Statistical Office 23/; the data were the latest available at the time of the study team's main mission to Thailand 24/. The estimated Mincerian functions relating to wage earners appear in table 4.1 25/. Two versions of the earnings function were estimated. The first (column 1) reflects the classical specification, which simply includes the schooling and experience variables; following standard practice, quadratic terms of these variables are included to allow for diminishing returns. In the second, modified version of the Mincerian function (columns 3 and 5) the schooling variable is disaggregated to generate estimates of the returns to a year's investment in the various types and levels of education 26/.

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23/ Three rounds of data are collected during the year to capture the substantial seasonality in employment in Thailand. Round 3 is collected during July-September, corresponding to the peak season in agriculture, and therefore to the period of maximum employment.

24/ Shortly after the completion of the present report, data for the 1989 Labor Force Survey also became available. However, owing to time constraints, only preliminary analyses were performed on these data. Some of the more relevant results are reported in annex tables A4.2 to A4.6.

25/ The results based on 1989 data are very similar to those for 1986. Additional estimates disaggregated by sex and sector of employment are presented in annex tables A4.1 to A4.3. Since the differences are not large, only the results presented in table 4.1 are discussed here.

26/ In this specification, the schooling variable is defined by a vector rather than a single number denoting total number of years of schooling. The vector has, in the regressions presented here, 7 arguments--primary, lower secondary, upper secondary, vocational secondary, vocational stream in higher education, teacher training, and academic higher education--each corresponding to different types or levels of education. An argument has one of two values: zero if the individual did not attend the level or type of education in question, or a value denoting the number of years spent in that particular segment of the education system. Unlike the classical Mincerian specification, this alternative permits the existence of discontinuities in the profitability of schooling investments along successive levels of education.

Table 4.1: Mincerian earnings functions by sector of employment, Thailand 1986 a/

<u>Independent variables</u>	<u>All sectors</u>				<u>Private sector</u>	
	<u>Equation A</u>		<u>Equation B</u>		<u>Coeff.</u>	<u>t-stat.</u>
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>		
Intercept	5.76		5.73		5.86	
Schooling (S)	0.124	26.5				
S <sup>2</sup>	0.0007	2.9				
Experience (Ex)	0.076	60.0	0.077	45.5	0.074	46.0
Ex <sup>2</sup>	-0.001	40.9	-0.001	32.2	-0.001	35.7
Yrs. of primary education			0.129	17.8	0.107	18.3
Yrs. of lower sec. education			0.162	18.6	0.153	20.0
Yrs. of upper sec. education			0.084	8.1	0.081	6.5
Yrs. of vocational education at secondary level			0.145	14.4	0.167	15.0
Yrs. of vocational education at higher education level			0.109	6.3	0.081	3.2
Yrs. of teacher training			0.104	9.1	0.083	4.5
Yrs. of higher education			0.222	20.0	0.305	20.9
R <sup>2</sup>	.55		.56		.42	
N	12,193		12,193		8,367	

a/ The dependent variable is annual earnings of individuals of both sexes; the data are drawn from the 1986 Labor Force Survey (third round) conducted by the National Statistical Office; additional regression results are shown in annex table 4.1.

4.4. According to the first specification, an extra year of schooling at the sample mean yields a private return of 12.4 percent, which is comparable to those for most other developing countries. However, the positive coefficient on the squared term for schooling deviates from what is normally observed 27/. Thus, instead of the common pattern of diminishing returns to investing in additional years of schooling, there is currently in Thailand rising returns. This result probably stems from the particular makeup of the Thai economy at present: a large agricultural sector which utilizes labor inputs of mostly low educational qualification, and a dynamic modern sector in which the demand for highly qualified workers is rising.

27/ This result is similar in regressions disaggregated by sex and sector of employment (see Appendix table A4.1). The absolute value of the coefficient is larger in regressions for private sector employees.

4.5. Turning next to the modified specification of the Mincerian function, the results are generally consistent with the above pattern. Returns continue to rise with educational level, but this trend is not continuous. In particular, the private returns to upper secondary schooling are particularly low: around 8 percent, compared to 15-16 percent for lower secondary education, and 20-30 percent for academic higher education.

4.6. As is well-known, the Mincerian regression equation yields estimates only of private returns, and do not incorporate the direct costs of education. To rectify these gaps, it is necessary first to generate an age-earnings profile from the estimated Mincerian functions. Merged with data on direct costs (borne by individuals and society), the result are cost-benefit streams from which private and social rates of return are easily computed (table 4.2 and figure 4.1). For each level of education, separate estimates are made corresponding to earnings data for people employed in all economic sectors, and in the private sector only 28/.

Table 4.2: Private and social rates of return by level of education, Thailand, 1986

	<u>Private</u>	<u>Social</u>
<u>Lower secondary</u>		
All sectors	16.6	13.6
Private sector	15.7	12.7
<u>Upper secondary (general)</u>		
All sectors	7.8	6.7
Private sector	4.1	3.6
<u>Upper secondary (vocational)</u>		
All sectors	14.9	11.4
Private sector	17.4	12.7
<u>Higher education (academic BA)</u>		
All sectors	21.2	13.5
Private sector	30.0	18.7
<u>Higher education (vocational)</u>		
All sectors	9.9	7.7
Private sector	7.1	5.5

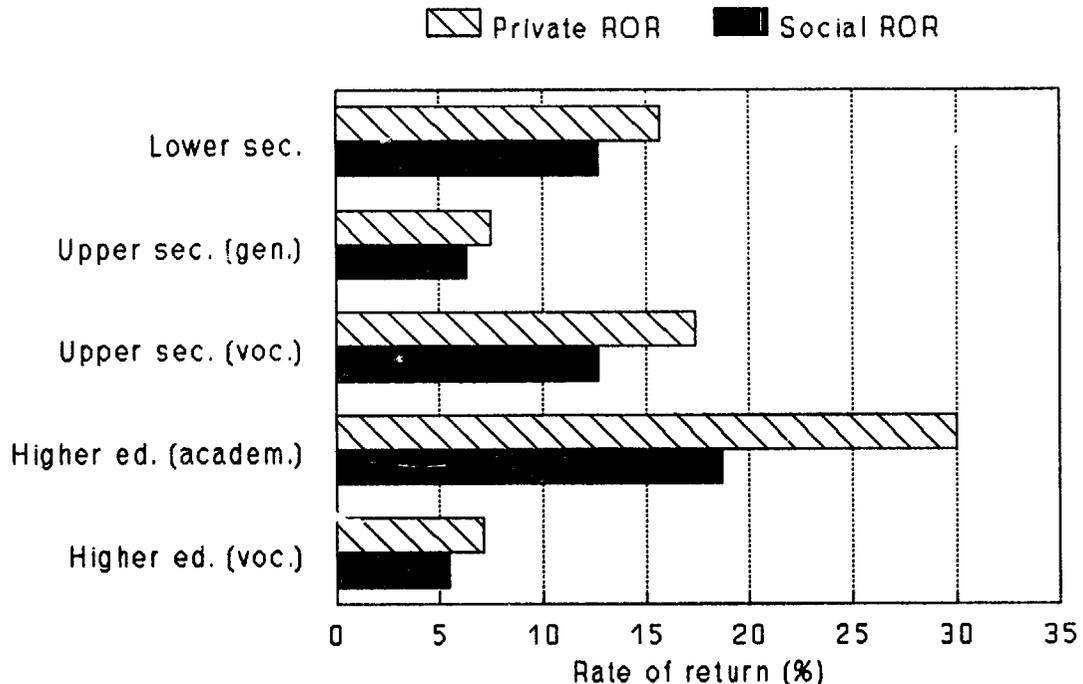
Source: calculated from regression results in table 4.1 and cost data in NSO, 1987b.

4.7. In general, the results echo those drawn directly from the regression estimates, showing clear discontinuities in returns by levels and types of education. They provide a preliminary basis for discussing future

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28/ The second set of results is particularly noteworthy because private sector wages are driven largely by market forces, and thus correspond more closely to labor productivity. Moreover, the indications are that increasingly the private sector will supply most of the new jobs in future, thereby emerging as the main player in determining the demand for educated labor.

directions for the development of education, including its output objectives, related resource allocation issues, as well as the management of student flow across the various levels and types of education. Note, however, that since the returns are based on data for 1986, a slump year in the Thai economy, the preliminary nature of the conclusions drawn is stressed.



Source: table 4.2.

**Figure 4.1:** Social and private rates of return to education in Thailand, 1986

4.8. First, regarding academic and general studies, the high social returns to lower secondary and (especially) higher education is indicative of a strong demand for people with these qualifications. Expanding output from these levels is probably warranted, although not necessarily uniformly across all fields of study <sup>29/</sup>. In contrast, the social returns to upper secondary education are very low--below the commonly used yardstick of 10 percent--, implying that expansion of this subsector may not be justified at present.

4.9. The stronger option of cutting back access is probably also not warranted, however, since it would reduce the pool of applicants for higher education expansion of which is probably justified. Moreover, such an option

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<sup>29/</sup> The distinction across fields of study is particularly important in higher education since costs vary widely, as does the demand for different people with different academic specializations.

would not address the root causes of low returns to upper secondary education. As will emerge from analysis to be presented below, part of the problem lies with the narrow access to higher education, which currently absorbs less than a quarter of upper secondary leavers. The exit of the remainder from the education system results in an oversupply of job seekers with upper secondary schooling, which depresses their wages, thereby generating the observed low returns. Thus, reducing the imbalance in returns across levels of education calls, not so much for restricting the number of people admitted to upper secondary education, but for improved access to higher education, probably involving changes in institutional structure and modes of student finance. These issues will be examined in greater detail below.

4.10. Second, regarding technical and vocational studies, the reasonably high social returns for vocational studies at the upper secondary level supports some expansion of this subsector. On the other hand, the very low returns at the higher education level suggest that expansion would not be externally efficient. Note, however, that vocational studies are highly differentiated across specializations, so care is called for in applying these broad conclusions. Analysis based on disaggregated data may well reveal a shortage of graduates in some fields in vocational higher education, despite a global situation of oversupply. Similarly, the relatively high returns to vocational upper secondary studies may well mask the reality that in some trades, too many graduates--possibly inadequately trained--are being produced.

4.11. (b) Other labor market signals. An intrinsic characteristic of the rate-of-return statistic is that it tends to change only slowly owing to the long horizons used in its calculation. As a result, short-run changes in the labor market are seldom captured by this statistic. Since conditions in the Thai labor market have been evolving rapidly in the years since 1986, it would appear useful to supplement the preceding evidence with data on other indicators. Presented below are trends unemployment, and advertised job vacancies 30/.

4.12. Table 4.3 show the size and rate of unemployment appear in the 1980s. Overall, Thailand has very low rates of unemployment, at least during the wet season to which the data refer. In the latter part of the 1980s, unemployment rates have dropped across all labor groups differentiated by educational qualification. For example, among people with higher education (academic stream), the unemployment rate sank below 3 percent in 1988, from over 5 percent in the previous year. Those with vocational qualifications tend to find jobs less easily--like most of their counterparts in other countries--, but they too experienced a similar decline in unemployment rates in recent years.

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30/ Wage trends should also provide useful insights into recent labor market dynamics. Preliminary tabulations from the 1986 and 1989 Labor Force Surveys appear in annex tables A4.5 and A4.6. Their implication for policy requires further analysis which are beyond the scope of the present report, given the time constraints.

**Table 4.3: Number of unemployed workers and rates of unemployment by level of educational attainment, Thailand, 1980-1988 a/**

	<u>Number unemployed ('000)</u>				<u>Rate of unemployment (%)</u>			
	<u>1980</u>	<u>1984</u>	<u>1987</u>	<u>1988</u>	<u>1980</u>	<u>1984</u>	<u>1987</u>	<u>1988</u>
<u>Elementary</u>								
< 4 years	12.6	12.3	14.8	5.2	0.4	0.4	0.6	0.2
4 or more years	99.8	83.0	156.1	90.3	0.6	0.4	0.7	0.4
<u>Secondary</u>								
General	40.9	47.8	65.3	59.3	3.8	3.2	3.0	2.5
Vocational	23.8	59.8	46.5	40.2	7.7	10	6.1	5.2
<u>Higher education</u>								
Academic	6.9	12.4	25.9	16.4	4.0	4.2	5.1	2.9
Vocational	4.3	20.4	34.0	24.7	5.1	11.9	11.2	5.7
<u>Teacher training</u>	12.4	17.3	11.1	9.3	3.5	3.2	1.8	1.6
<u>Total</u>	204.2	255.5	354.7	245.8	0.9	1.0	1.3	0.8

a/ Unemployed people refer to those "looking for work."

Sources: NSO 1980, 1984, 1987, and 1988.

4.13. That labor market conditions have changed emerges even more sharply from the data on marginal rates of unemployment. These rates are defined as the change in the number unemployed between two consecutive periods relative to the change in the size of labor pool (sum of employed and unemployed people) in the corresponding period. If at least as many jobs has been created as graduates have entered the labor market, the result would be no change or a decline in the number of unemployed people, and the corresponding marginal rate of unemployment would be zero. Table 4.4 shows that relevant data for selected periods during the 1980s. They indicate that since 1987, labor market conditions have been exceptionally good for entrants in all educational groups, with new jobs at least as numerous as the number of school leavers.

**Table 4.4:** Marginal rates of unemployment by level of educational attainment, Thailand 1984-1987 a/

	<u>1980-84</u>	<u>1984-87</u>	<u>1987-88</u>
<u>Elementary</u>			
< 4 years	0	0	0
4 or more years	0	2.0	0
<u>Secondary</u>			
General	1.6	2.5	0
Vocational	14.4	0	0
<u>Higher education</u>			
Academic	4.7	6.9	0
Vocational	22.3	11.6	0
<u>Teacher training</u>	2.7	0	-
<u>Total</u>	1.5	6.0	-

a/ The marginal rate of unemployment between years t1 and t2 is calculated as  $(U_{t2} - U_{t1}) / (L_{t2} - L_{t1})$  where  $U_{t2}$  and  $U_{t1}$  refer to the number of people unemployed respectively in years t1 and t2; and  $L_{t1}$  and  $L_{t2}$  refer to the labor pool (the sum of employed and unemployed people) in years t1 and t2 respectively; when  $U_{t2}$  is less than  $U_{t1}$ , the marginal rate of unemployment is zero.

Sources: As in table 4.3.

4.14. The job vacancies advertised by private sector employers provide even stronger evidence in this regard (table 4.5). Demand for practically all types of labor has been rising every year since 1986, the increase being particularly sharp between 1989 and 1990. Currently, one of the most sought after group appears to be secondary school leavers; although no distinction in the data is made between lower and upper secondary school leavers, demand is likely to be equally strong for both types of workers, given the prevailing market conditions; no data on recent wage trends is, however, available to confirm this surmise.

**Table 4.5:** Number of job vacancies advertised during Jan-Mar by educational qualification specified, Thailand, 1986-1990

	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
Primary	391	181	193	505	1,637
Secondary	1,785	2,649	5,074	7,786	11,811
University	969	1,020	1,741	2,150	2,569
Unspecified	8,195	10,730	10,004	11,191	17,218
<u>Total</u>	11,340	14,580	17,012	21,632	33,235

Source: Department of labor, based on data collected from newspapers.

4.15. (c) Overall directions for educational expansion. Economic conditions have improved dramatically since 1986, the year for which rates of return have been estimated. Employment trends reinforce the justification based on cost-benefit analysis for increasing the output of lower secondary and higher education graduates. Regarding upper secondary education and vocational studies (especially in higher education), however, there appears to be a conflict of signals, with the data on returns suggesting restraint in expansion against the opposite message from the post-1986 data on unemployment and job vacancy trends. Which of these signals should be given greater weight in shaping educational planning for the 90s? The answer depends, in part, on the economic outlook for the next decade. There is obviously some uncertainty in making forecasts, but the broad characteristics of the Thai economy, and the macroeconomic trends summarized in chapter 1 suggest that growth will probably remain buoyant, sustaining the recent surge in demand for educated labor.

4.16. To the extent that this assumption is valid, more weight should be put on recent labor market signals to guide educational planning for the 90s. Thus, for upper secondary education, there may be a case for cautiously expanding enrollments despite the low social returns estimated from 1986 data. The output would meet what appears to be a growing demand on the job market for people with this level of education, as well as enlarge the pool from which the expanding higher education subsector can draw its intake. Regarding vocational higher education, the case for expansion can be made along similar arguments, but given the normally high unit costs of such studies, it is unclear whether wages would rise sufficiently in the tightening labor market to produce a socially attractive rate of return. Expansion should thus be considered carefully.

#### IV.2 Mechanisms toward realizing the desired expansion goals

4.17. Having considered the future course for educational development, the obvious next step is to assess specific mechanisms to bring about growth in the desired directions. The design of these activities is influenced, in part, by assumptions about individuals' behavior. An extreme proposition is that people lack the relevant information, or do not incorporate it in a timely fashion when making choices about their education. As a result, if left unaided, they would almost always never make socially optimal decisions. An opposite assumption is that individuals have as much information as anyone else and respond rapidly and rationally to economic and labor market signals in their choices. In this case, government intervention would be totally redundant.

4.18. Neither of these polar assumptions is particularly realistic, however. Experience shows that by and large people are aware, even if imperfectly, of pertinent labor market information and that they do incorporate such data in making choices about education. Admittedly, this model applies more readily under stable economic conditions, where market signals can be read and understood relatively easily. In Thailand, shifts in the economy have been so dramatic and rapid in recent years, that it is reasonable for individuals' behavior to lag somewhat behind those changes. In

this context, some facilitating intervention by the government would be warranted to align private choices more closely to labor market demands. Beyond this consideration, government action is of course also justified to mitigate market failure, such as occurs in the absence of mechanisms of student finance 31/.

4.19. Bearing in mind the above considerations, the following discussion attempts to set out the broad outlines for government intervention to foster development of the education system in an externally efficient direction. The focus is on general studies at the post primary levels 32/.

4.20. (a) Lower secondary education. It is a fact that secondary education is less well-developed in Thailand compared to other countries at similar income levels. Some observers attribute this outcome not so much to the lack of school places as to the weak demand for secondary schooling caused by cultural factors. Correspondingly, it is argued that public intervention would be needed to promote higher rates of attendance, particularly if the country's aspirations for economic growth are to be fulfilled. The recent extension of compulsory schooling notwithstanding, some observers argue that additional intervention through financial incentives for school attendance--to cover, for example, direct costs and forgone earnings--might also be needed.

4.21. Such strong intervention, if intended globally, warrants careful consideration. As with other subsidies, an obvious problem is that once financial incentives are introduced, they are often not easily withdrawn (unless reversibility, often an elusive feature, is deliberately incorporated in their design), even when the specific circumstances justifying their initial introduction, no longer apply. Perhaps more importantly, the underlying assumption for such intervention--that the demand for education is only weakly, if at all, responsive to economic signals--is inconsistent with recent trends in transition rates between primary and lower secondary education (table 4.6).

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31/ Student finance is a particularly important issue in post secondary education, and will be discussed in greater detail below.

32/ As indicated before, vocational education issues would need to be addressed via more detailed analysis, some of which is available in several recent World Bank studies (e.g. Brimble, 1990; Dollar, 1989; Middleton et. al., 1989; and World Bank, 1990).

**Table 4.6: Transition rates between primary and secondary education 1982-1989, Thailand**

	<u>Thailand</u>	<u>Bangkok</u>
1981/82	39	-
1982/83	39	-
1983/84	39	-
1984/85	38	-
1985/86	37	93
1986/87	37	95
1987/88	43	95
1988/89	47	98
1989/90	48	-

Sources: Sussangkarn, Ashakul and Meyers (1989) for 1981-84; and NEC printout for 1985-1989.

4.22. These rates have been stagnant for most of the first half of the decade, but rose sharply from 1987 onwards, coinciding closely with the timing of the economy's upswing. The short lag in individuals' behavior suggests, if anything, that people are in fact quite responsive to labor market signals in making decisions about education. It is noteworthy that the rise in transition rates is due mostly to increases in areas outside the Bangkok metropolitan region where transition rates were already nearly universal in 1985.

4.23. The empirical support for using extensive and heavy subsidization to promote attendance in lower secondary education thus appears to be somewhat weak. This broad conclusion does not, of course, invalidate the provision of (much) more narrowly targeted incentives. Data presented in the previous chapter suggest that for academically deserving children from low income families, rather substantial incentives might in fact be warranted.

4.24. (b) Upper secondary education. Transition rates appear also to have risen in recent years, reportedly from 65 percent in 1984 (according to Phananimai and Mason, 1987) to 78 percent in 1988 (NEC, 1989). A priori, this trend is paradoxical given the low private returns associated with this level of schooling. While returns have probably improved in recent years, it is doubtful that the shift has been sufficiently large to account for the observed steep rise in demand. A closer look at the determinants of demand is needed to unlock this paradox.

4.25. To begin with, the decision of individuals to enroll in a particular level of education is motivated both by its economic value per se and by its option value. The first factor refers simply to the value arising out of employers' demand for workers with the corresponding qualification. The second refers to the value individuals attach to having the option of continuing beyond the particular level of education in question (Weisbrod, 1964). In situations where private returns diminish with rising levels of education, option value considerations have no bearing on private demand behavior. They become a significant influence, however, when this pattern

does not hold, as is currently the case of upper secondary education in Thailand.

4.26. According to the previously-reported estimates for 1986, the private returns to this level of study are quite low, whereas those to higher education are exceptionally large. The relevant influence on demand in this context are not the actual returns to upper secondary education but its expected returns, which depends, by definition, on the probability of gaining access to higher education <sup>33/</sup>. Estimates of expected returns appear in table 4.7, indicating that even with entry probabilities as low as 25 percent, they are, at 13 percent, still sufficiently large to make investing in upper secondary education privately worthwhile. This outcome explains why demand remains strong even though less than a quarter of upper secondary school leavers actually go on to higher education at present.

Table 4.7: Private rates of return to upper secondary education according to probability of gaining access to higher education, Thailand

<u>Probability</u>	<u>Rate of return (%)</u>
0	7.5
0.25	13.1
0.50	16.0
0.75	18.0
1	19.4

Source: authors' calculation based on estimates reported in tables 4.1 and 4.2.

4.27. The preceding analysis suggests that restricting the access to upper secondary education would not be particularly effective as an option to improve the education system's external efficiency. To this end, attention must turn instead to widening the access to higher education, a development which would solve two problems simultaneously: it would respond to the strong labor market demand for higher education graduates, and at the same time reduce the influx of upper secondary school leavers onto a labor market that already has an excess supply of such workers. Labor market conditions have been evolving, of course, and recent indicators suggest that the demand for all kinds of workers has grown since 1986. In this dynamic setting, expansion of both upper secondary and higher education is probably appropriate, but in relative terms, the latter should probably grow at a faster rate.

4.28. Within upper secondary education, public intervention can be considered mainly to promote equity. As for lower secondary education, such intervention could take the form of financial incentives targeted toward deserving individuals from low-income groups.

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<sup>33/</sup> Estimated on the basis of net expected income streams corresponding to different probabilities of entering higher education.

4.29. (c) Higher education. This part of the education system deserves special emphasis in terms of policy changes. Because the issues involved are intricate, it is worth highlighting some salient features of this subsector before discussing the policy options.

4.30. Its distinctive features. First, its main institutional components are highly differentiated. Traditional public institutions admit students strictly on academic criteria, and are characterized by relatively small enrollments (totalling about 123,000 in 1989), and large unit costs (B60,000 per student in 1989), of which only about 6 percent is recovered via student fees. Private colleges and universities enroll even fewer students, about 77,000 in 1989, but enrollments have been growing rapidly in recent years. Most of their operating costs are financed through student fees which currently varies widely around an average of about B18,000 per student. The open/distance universities (RU and STOU) together enroll the largest number of students, about 460,000 in 1989. Besides producing graduates for the labor market, they also fulfil a "cooling out" function <sup>34/</sup>. Their unit costs are low (B3,000 per student), about half of which are recovered via student fees. Aside from the preceding institutions which are under the jurisdiction of the Ministry of University Affairs, teacher colleges which are under the Ministry of Education also offer degree level courses. Their enrollments are sizable, but they have been traditionally oriented toward training school teachers.

4.31. Places in the traditional public universities are highly coveted due to their prestige and the heavy subsidies provided. Successful applicants come predominantly from upper income groups as table 3.13 in the previous chapter documents. Thus, although the application of stiff entrance criteria helps to uphold academic standards without intentionally favoring a particular social group, it nevertheless has led to adverse social selectivity. Unsuccessful applicants can either enroll in private institutions or the open/distance systems. A priori, the former are preferred for quality reasons, but access is, by and large, limited to those who can afford the substantial fees, which are, at an average of B18,000 annually, beyond the means of all but the richest families <sup>35/</sup>. The high fees notwithstanding, private higher education remains profitable to individuals, yielding an estimated 20 percent private rate of return.

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<sup>34/</sup> Clark's (1964) terminology refers to the sociological function of higher education which rationalizes enrolling more students than the number justified on purely economic grounds (i.e. producing workers for gainful employment). By helping to diffuse a potentially dangerous build-up of frustration created by limited entry (especially among unsuccessful aspirants), the extra places fulfill a "cooling-out function."

<sup>35/</sup> The mean monthly parental income of students enrolled in private institutions was B15,000 in 1986, compared to an average of about B2,300 in the general population.

4.32. For most people, however, non-admission to a traditional public institution effectively leaves only RU or STOU as options for pursuing higher education. As expected students from lower SES backgrounds are better represented there; in STOU, for example, about 44 percent of students' parents are farmers or laborers (as before see table 3.12). The private returns to distance higher education are lower, however. Thus, besides not benefiting from the heavy subsidies provided to conventional public universities, students in the open systems are also at a disadvantage in terms of earnings potential. As a result, the social disparities in the access to higher education has a particularly adverse impact on income distribution.

4.33. Two main reasons are, ex-ante, responsible for the lower private returns to distance higher education: students take longer to complete their courses, about twice as long as others pursuing similar courses in conventional institutions; and among those who enroll, many fail eventually to graduate, so affecting students' perceived probability of completion 36/. Earnings differentials also matter, but turn out to be a relatively modest factor since they reflect in large part differences in the fields of study offered in the various institutions.

4.34. To elaborate, table 4.8 summarizes regression results on the earnings of higher education graduates, using data from a 1985 survey conducted by NEC. In one regression, the independent variables include experience, sex, parental SES, and dummy variables indicating type of alma mater 37/. In a second regression, field of study is added as an additional independent regression variable.

Table 4.8: Percentage differences in graduate earnings, Thailand 1985 a/

Standardized for	<u>Conventional institutions</u>			<u>Open</u>
	<u>Private</u>	<u>Public</u>		<u>universities</u>
		<u>Prestigious</u>	<u>Other</u>	
Experience, sex, and parental SES	0	+14.3	+0.4	-9.1
Experience, sex, parental SES, and field of study	0	+16.2	+4.1	-2.0

a/ The reference group are graduates from conventional private institutions.

Source: based on earnings regression estimates reported in appendix table A4.7.

36/ Comparing student intake to the output of graduates 6 years later, suggest that only about 30 percent of them succeed in completing the course.

37/ For this purpose, distinction is made among prestigious public universities, other conventional public universities, and open universities. The omitted group is private universities.

4.35. Clear differences in earnings exist when field of study is left out in the regression; for example, individuals with degrees from the open universities earn about 9 percent less than private university graduates. Those from prestigious public universities (such as Chulalongkorn) earn significantly more, over 14 percent more than private university graduates, and 23 percent more than open university graduates 38/. Graduates from other conventional public institutions earn about the same as their private sector counterparts.

4.36. When field of study is controlled for, the change in regression results is instructive. The earnings of graduates from all 3 types of public institutions--prestigious universities, other conventional institutions and the open systems--improved relative to those of their peers from private institutions 39/. For example, graduates from prestigious public universities now earn 16.2 percent more, compared to 14.3 percent more in the absence of control for field of study; and those from RU and STOU earn 2.0 percent less compared to 9.1 percent less previously. The difference in regression results suggests that the private sector tend, in general, to emphasize the economically more profitable fields in its course offerings 40/. The open universities are at a particular disadvantage in this regard since they do not offer courses in what are currently the most profitable fields, namely engineering and medicine. These are of course fields in which instruction is difficult, if not impossible, to render in their setting.

4.37. Elements of a policy for higher education. The purpose here is not to make recommendations but to identify potentially useful areas for policy changes. to promote efficiency and equity. As a sectoral objective, there is little disagreement that the number of graduates has to be increased to match the growing demand on the labor market. Expansion is a priority in such fields as engineering, medicine, agriculture, business administration and architecture, which currently have the highest social rates of returns. To facilitate the realization of this objective, the following changes in the subsector's arrangements might be considered:

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38/ The superior earnings of graduates from prestigious universities is not surprising given the enormous differences in resource allocation.

39/ However, only the earnings of graduates from the prestigious universities are significantly larger than those of graduates from private institutions. The coefficients on the other dummy variables relating to alma mater are either small or statistically insignificant, suggesting modest or non-existent earnings gaps.

40/ The difference in emphasis reflects in large part the fact that students bear most, if not all, of the very large cost of their education in the private sector, and are therefore more strongly motivated to choose fields for which there are good employment and earnings prospects.

- 4.38. (i) Diversify its structure. In any system of higher education, a valuable feature is its ability to cope with diversity in the characteristics of prospective students and the nature of labor market demand. Responding to this diversity calls for expanding the menu of course offerings, in terms of fields of study, and types and "levels" of courses. This development does not preclude specialization at the institutional level, but it does mean that the subsector should, in aggregate, provide a wide menu of educational options. The private sector has a useful role in this respect, given its flexibility and responsiveness to demand signals.
- 4.39. Various features of Thailand's system of higher education suggest that it is probably not sufficiently diversified at present: (a) most of the public conventional institutions are clustered at the upper end of the quality spectrum; (b) the private sector is controlled by government regulations that constrain it to operate much like the public sector 41/; (d) the teacher colleges under the MOE are just beginning to shift their orientation, and have as yet an unclear role; and (c) the system is sharply dichotomized between the massive open universities and the highly selective closed universities. While this dual system may be advantageous in some respects, the current distribution of enrollments between the two parts of the system is nevertheless debatable.
- 4.40. Given that expansion of the system is desired, an option for diversification is simply to create additional public conventional universities 42/. It is important, however, that they differ from existing institutions, since their intended clientele comprises students who, while not necessarily the brightest in the country, can nevertheless benefit from a less demanding course of study. A second option for diversification is to relax the stringent regulations governing the operation of private universities, and to provide for accreditation on a differentiated scale of academic excellence.
- 4.41. (ii) Rationalize the allocation of public spending. The current pattern of resource allocation strongly favors the closed public universities, given their very high costs and heavy subsidization of students. There is probably some scope for

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41/ For example, in the accreditation process, some of the requirements imposed on private universities by the authorities--such as faculty-student ratios, the specification of scientific equipment, and so on--are based on the characteristics of public institutions.

42/ In discussions with government officials, it has been suggested that upgrading teacher colleges and redirecting their mission toward the general labor market might also be an option worth consideration.

reducing costs through improved administrative arrangements (for example, to raise the relatively modest student-faculty ratios) and increased student fees <sup>43/</sup>. The resources thus saved could be used to augment spending elsewhere in the system, including the open universities (especially RU) which currently appear to be at a strong disadvantage in terms of funding. This shift in public spending would also promote equity since the diversion would be away from a socially privileged group.

- 4.42. Public spending on higher education could also be adjusted to provide stronger support for research. This is because the market demand for research output, except in applied fields, is generally weak owing to free-rider problems; a result is that such activities tend not to be pursued except with public subsidies. In contrast, subsidies to support teaching services are less important since users are much more willing to pay for those services, being able to capture most of the benefits personally. The current allocation of public spending on higher education tends, however, to emphasize teaching rather than research. The limited resources to support research are awarded via open competition, but grants are so small that they interest only the public universities where financial viability is not as immediate a concern as in private institutions. Diversification in research is hampered as a result, and the research capability of the sector as a whole undeveloped. To address these problems calls for increased funding for research, both to enlarge the size of grants and to increase their number. Increased competition for those funds from a cross-section of institutions would also be desirable.
- 4.43. (iii) Improve the mechanisms for student finance. Given the heavy subsidies and low fees in regular public universities, the current financing arrangements are akin to a blanket scholarship scheme covering a limited part of the system. Aside from having a perverse impact on equity, they also limit the impact of public spending. These outcomes can be ameliorated by changing the mechanisms for student finance, as elaborated below.
- 4.44. To begin with, recall that expansion of the system is a priority in fields that are more suitably offered in conventional settings. In recent years, private universities

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<sup>43/</sup> See Tan and Mingat (1989) for evidence from cross-country data suggesting that the greater the proportion of costs privately financed by students, the lower tends to be unit costs. This result arises because accountability in the use of resources is a more pressing concern when students bear a non-trivial part of the costs of their education.

have mushroomed in response to a growing demand, driven not only by labor market conditions, but also by the fact that places in public regular universities are highly limited. In this situation, enlarging the access to public closed universities is probably unavoidable. There are, however, two immediate problems: given that unit costs are larger in public than private closed universities, this expansion would enlarge a relatively inefficient part of the system; in addition, it is likely to attract wealthy students who would otherwise have enrolled in private universities. As a result, the social selectivity in closed institutions would persist.

- 4.45. Needed to avoid these outcomes is replacement of the current system of blanket subsidies by a scholarship scheme more sharply targeted to qualified students from economically disadvantaged families 44/. Assuming that funds for higher education are not unlimited, this change would require those outside the target group to bear a larger share of the costs of their education 45/. In addition, to stimulate greater competition across institutions (which would promote efficiency), it would be desirable to permit scholarship-holders to enroll in institutions of their choice, rather than restrict them only to public universities.
- 4.46. Aside from scholarships, loan schemes, such as the one announced recently proposed by the National Teacher Council Board, provide a supplementary device to enhance financing arrangements. Their availability essentially assists students who do not quite qualify for scholarships, but who are unable to finance their studies from current resources. Although student loans need not be subsidized, they often are owing to application of below market interest rates and easy repayment

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44/ A case can nevertheless be made for providing a limited number of scholarships that are awarded purely on the basis of ability, without regard to family background.

45/ In other words, fees would need to increase as part of the package of new financing arrangements. To avoid the adverse impact of inflation, it is very important that fees are set in relative rather than absolute terms (for example, relative to cost per student). Experience shows that once people get used to a given schedule of fees stated in absolute amounts, adjusting them for inflation almost always require a major political effort. At what levels fees should be set is obviously important policy issue. Although not addressed in detail here, evidence in Tan and Mingat (1989) based on experience in a cross-section of countries suggest that full cost recovery is justified neither on efficiency and equity grounds, since the advantage in these respects diminish beyond a recovery rate of about 40 percent. Given that fees in closed public institutions are currently only about 6 percent, there is some scope for an non-trivial increase.

terms. The larger the implicit subsidies, the more access would need to be targeted in order to avoid the re-emergence of blanket subsidies in another form.

**APPENDIX TABLES**

**Table A2.1: Aggregate public spending by level of education 1985-1990**  
(million Bhat)

<u>Year</u>	<u>Elementary</u>	<u>Secondary</u>	<u>Technical Institutions</u>	<u>Closed Universities</u>	<u>Open Universities</u>	<u>Total (incl.others)</u>
1985	23,066	7,139	2,818	5,113	220	39,593
1986	23,256	7,528	2,707	5,140	235	38,823
1987	24,326	7,755	2,650	5,190	236	41,111
1988	25,590	8,321	2,790	5,710	244	43,861
1989	26,773	9,061	2,999	6,535	274	47,358
1990	33,201	11,548	3,751	8,260	328	59,573

Sources: BOB, 1985 to 1990; NEC, 1989b; MUA, 1988.

**Table A2.2: Enrollment in public sector by level of education, 1985-1990**

<u>Year</u>	<u>Elementary</u>	<u>Secondary</u>	<u>Technical Institutions</u>	<u>Closed Universities</u>	<u>Open Universities</u>
1985	6,497,000	1,650,000	313,700	107,560	569,900
1986	6,515,000	1,634,600	300,100	113,450	565,500
1987	6,446,000	1,584,700	287,100	115,890	521,700
1988	6,344,000	1,563,300	274,000	117,600	523,500
1989	6,324,000	1,597,700	264,800	123,200	459,100

Sources: NEC, 1989b; MUA, 1988.

**Table A2.3: Pre-School Enrollment by Type of Institutions**  
(thousands)

<u>Year</u>	<u>Public</u>	<u>Private</u>	<u>Total</u>	<u>% Public</u>
1978	130.2	169.7	299.9	43.4
1979	143.8	189.4	333.2	43.2
1980	158.7	205.2	363.9	43.6
1981	174.7	222.6	397.3	44.0
1982	189.4	232.4	421.7	44.9
1983	226.3	243.3	469.5	48.2
1984	286.2	259.2	545.4	52.5
1985	389.8	273.1	671.9	59.4
1986	733.1	276.0	1009.1	72.6
1987	876.6	281.9	1158.5	75.7
1988	1081.7	300.3	1381.8	78.3
1989	942.9	332.7	1275.6	73.9

Source: NEC, 1989b.

**Table A2.4: Primary Enrollment by Type of Institution**  
(thousands)

<u>Year</u>	<u>Public Schools a/</u>				<u>Private Schools</u>	<u>Grand Total</u>	<u>% Public</u>
	<u>National</u>	<u>Municipal</u>	<u>Others</u>	<u>Total</u>			
1978	5,707	424	167	6,298	620	6,918	91.0
1979	6,014	439	178	6,631	620	7,251	91.5
1980	6,112	443	185	6,740	632	7,372	91.4
1981	6,318	440	38	6,796	615	7,411	91.7
1982	6,282	441	34	6,757	622	7,379	91.6
1983	6,161	439	38	6,638	614	7,252	91.5
1984	6,126	419	40	6,585	630	7,215	91.3
1985	6,045	433	19	6,497	641	7,137	91.0
1986	6,032	441	42	6,515	641	7,160	91.0
1987	5,956	447	43	6,446	654	7,100	90.8
1988	5,869	449	26	6,344	664	7,009	90.5
1989	5,851	448	25	6,324	662	6,986	90.5

a/ "National" column refer to enrollment in schools under the Ministry of education; the Municipal column refer to those in schools under local governments; and the "other" column refer to enrollments in teachers' colleges and universities.

Source: NEC, 1989b.

**Table A2.5: Secondary Enrollment by Type of Institution**  
(Thousand)

<u>Year</u>	<u>Public</u>	<u>Private</u>	<u>Total</u>	<u>% Public</u>
1978	1150.4	329.5	1479.9	77.7
1979	1232.0	316.6	1548.8	79.6
1980	1300.4	308.4	1608.7	80.8
1981	1328.8	240.5	1569.3	84.7
1982	1428.3	235.9	1664.2	85.8
1983	1511.2	229.4	1740.6	86.8
1984	1623.0	233.3	1856.3	87.4
1985	1650.6	219.4	1870.5	88.2
1986	1634.6	197.6	1832.2	89.2
1987	1584.7	184.0	1768.7	89.6
1988	1563.3	182.4	1745.6	88.3
1989	1594.7	183.1	1780.8	89.7

Source: NEC, 1989b.

**Table A2.6: Vocational Enrollments under Ministry of Education**  
(thousands)

<u>Year</u>	<u>Public institutions</u>				<u>Private sector</u>	<u>Grand Total</u>	<u>% Public</u>
	<u>Dept of V Education</u>	<u>Technical Colleges</u>	<u>Fine Arts Program</u>	<u>Total</u>			
1978	102.0	44.1	2.5	148.6	103.5	252.1	59.0
1979	116.2	45.0	2.3	163.5	131.7	295.2	55.4
1980	137.8	45.4	2.5	195.7	155.2	340.9	54.5
1981	198.3	50.6	3.7	242.6	239.7	482.3	50.3
1982	213.5	54.3	4.3	299.1	251.2	522.3	54.9
1983	232.2	56.8	4.7	293.7	275.0	568.7	47.7
1984	241.5	57.3	4.6	303.4	253.7	557.1	54.5
1985	250.7	58.6	4.4	313.7	237.5	551.2	56.9
1986	240.1	55.9	4.1	300.1	207.9	508.0	59.1
1987	227.4	55.5	4.2	287.1	201.9	489.0	58.7
1988	214.6	55.1	4.3	274.0	195.5	469.5	58.3
1989	210.4	50.1	4.3	264.8	199.6	464.4	57.0

Source: NEC, 1989b.

**Table A3.1: Names of provinces making up educational and geographic regions, Thailand**

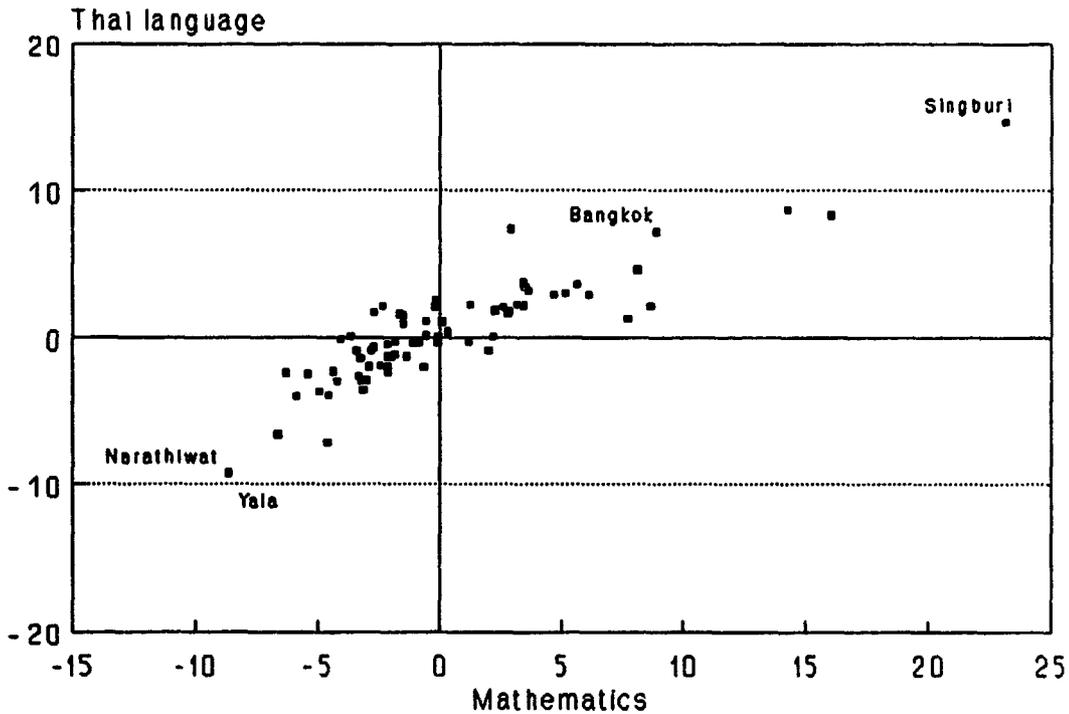
<b>Geographic region</b>	<b>Educational region</b>	<b>Provinces</b>	
<b>I CENTRAL (around Bangkok)</b>	1	Nakhonpathom Nonthaburi Pathumthani	Samutprakan Samutsakhon
	2	Yala Pattani	Narathiwat Satun
	3	Songkhla Phattalung Suratthani	Nakhonsithammarat Chumphon
<b>SOUTH</b>	4	Phuket Trang Krabi	Phangnga Ranong
	5	Ratchaburi Phetchaburi Prachuapkhirikhan	Supanburi Kanchanaburi Samutsongkhram
<b>II CENTRAL</b>	6	Lopburi Ayutthaya Angthong Saraburi	Singburi Uthaithani Chainat
	7	Phitsanulok Tak Kamphaengphet Nakhonsawan	Pichit Uttaradit Sukhothai Phetchabun
<b>NORTH</b>	8	Chiangmai Lampang Maehongson Chiangrai	Nan Lamphun Phrae Phayao
	9	Udonthani Loei Sakonkakhon	Khonkaen Nongkhai
<b>NORTH-EAST</b>	10	Ubonratchathani Roi Et Nakhonphanom Mahasarakham	Yasothon Kalasin Mukdahan
	11	Nakhonratchasima Surin Sisaket	Buriram Chaiyaphum
<b>III EAST CENTRAL</b>	12	Chachoengsao Prachinburi Nakhonnayak Chonburi	Chanthaburi Rayong Trat
<b>BANGKOK METROPOLITAN AREA</b>	13	Bangkok	

**Table A3.2: Regional patterns of achievement scores in mathematics and Thai language, Thailand, 1985-1988**

	<u>Thai</u>	<u>Mathematics</u>
<u>Average national score:</u> 1985-1988	59.2	43.2
<u>Regional deviations from national average (X):</u>		
Bangkok	7.0	10.9
Region 1	4.6	3.2
2	-7.6	-6.7
3	-0.6	-0.9
4	-0.8	-2.5
5	2.0	2.3
6	1.3	1.5
7	-1.2	-1.2
8	0.8	-1.8
9	-1.2	-1.6
10	1.4	3.7
11	-1.5	-1.9
12	1.2	1.7

Source: ONPEC, 1989.

Note: See appendix table A3.1 for provincial composition of each educational region.



**Figure A3.1: Relationship between achievement in mathematics and Thai language, by province, Thailand 1985-1988**

Table A4.1: Mincerian earnings functions by sector of

<u>Independent variables</u>	<u>All sectors</u>			
	<u>Men (equation A)</u>		<u>Men (equation B)</u>	
	<u>Coeff.</u>	<u>t-stat.</u>	<u>Coeff.</u>	<u>t-stat.</u>
Intercept	5.85		5.88	
Schooling (S)				
S <sup>2</sup>				
Experience (Ex)	0.079	45.5	0.076	43.7
Ex <sup>2</sup>	-0.001	32.2	-0.001	31.6
Yrs. of primary education	0.127	17.8	0.120	17.2
Yrs. of lower sec. education	0.133	18.6	0.129	17.9
Yrs. of upper sec. education	0.084	8.1	0.083	8.2
Yrs. of vocational education at secondary level	0.142	14.4	0.123	12.8
Yrs. of vocational education at higher education level	0.131	6.3	0.121	6.0
Yrs. of teacher training	0.094	9.1	0.107	10.4
Yrs. of higher education	0.223	20.0	0.225	20.7
Employed in public enterprise b/			0.519	18.3
Employed in private sector b/			0.021	1.3
R <sup>2</sup>	.52		.55	
N	6,834		6,834	

a/ The dependent variable is annual earnings of individuals of both sexes; the data are drawn from the 1986 Labor Force Survey (third round) conducted by the National Statistical Office. See footnote in table 4.1 for variable definitions.

b/ Dummy variables whose values equal 1 when individual is employed in the sectors

Table A4.2: Mincerian earnings functions by sector of employment, Thailand 1989 a/

<u>Independent variables</u>	<u>All sectors</u>				<u>Private sector</u>	
	<u>Equation A</u>		<u>Equation B</u>		<u>Coeff.</u>	<u>t-stat</u>
	<u>Coeff.</u>	<u>t-stat</u>	<u>Coeff.</u>	<u>t-stat</u>		
Intercept	5.90		5.86		6.01	
Schooling (S)	0.115	22.5				
S-squared	0.0009	3.7				
Experience (Ex)	0.073	54.8	0.073	55.0	0.070	41.6
Ex-squared	-0.001	36.5	-0.001	37.1	-0.001	31.2
Yrs. of primary education			0.122	22.2	0.100	16.0
Yrs. of lower sec. education			0.163	27.0	0.163	20.6
Yrs. of upper sec. education			0.066	7.8	0.058	4.6
Yrs. of vocational education at secondary level			0.143	17.9	0.149	13.3
Yrs. of vocational education at higher education level			0.074	4.9	0.067	3.0
Yrs. of teacher training			0.104	14.2	0.075	4.5
Yrs. of higher education			0.234	26.6	0.293	20.3
R-squared	51.3		53.0		39.2	
N	11,853		11,853		8,289	

a/ The dependent variable is annual earnings of individuals of both sexes; the data are drawn from the 1989 Labor Force Survey (third round) conducted by the National Statistical Office; additional regression results are shown in annex table A4.3.

**Table A4.3: Mincerian earnings functions by sector of employment and sex, Thailand 1989 a/**

<u>Independent variables</u>	<u>All sectors</u>						<u>Private sector</u>			
	<u>Men (equation A)</u>		<u>Men (equation B)</u>		<u>Women</u>		<u>Men</u>		<u>Women</u>	
	<u>Coeff.</u>	<u>t-stat.</u>	<u>Coeff.</u>	<u>t-stat.</u>	<u>Coeff.</u>	<u>t-stat.</u>	<u>Coeff.</u>	<u>t-stat.</u>	<u>Coeff.</u>	<u>t-stat.</u>
Intercept	6.04		5.96		5.94		6.12		6.19	
Schooling (S)										
S-squared										
Experience (Ex)	0.077	42.0	0.075	41.0	0.063	34.0	0.076	33.5	0.053	2
Ex-squared	-0.001	29.3	-0.001	29.2	-0.001	24.1	-0.001	25.5	-0.001	1
Yrs. of primary education	0.108	13.6	0.105	13.5	0.097	13.4	0.095	10.5	0.065	
Yrs. of lower sec. education	0.135	17.3	0.136	17.6	0.197	21.6	0.138	13.5	0.180	1
Yrs. of upper sec. education	0.068	6.2	0.068	6.4	0.063	5.1	0.065	3.8	0.059	
Yrs. of vocational education at secondary level	0.140	13.5	0.122	12.0	0.152	13.1	0.147	9.8	0.163	1
Yrs. of vocational education at higher education level	0.108	5.2	0.118	5.9	0.024	1.2	0.115	3.7	0.010	
Yrs. of teacher training	0.096	9.4	0.117	11.6	0.129	12.9	0.084	3.3	0.091	
Yrs. of higher education	0.240	20.4	0.245	21.3	0.235	19.2	0.310	15.9	0.269	1
Employed in public enterprise b/			0.563	19.2						
Employed in private sector b/			0.106	5.8						
R-squared	49.5		52.2		59.4		39.5		41.8	
N	6,547		6,547		5,305		4,420		3,868	

a/ The dependent variable is annual earnings of individuals of both sexes; the data are drawn from the 1986 Labor Force Survey (third round) conducted by the National Statistical Office. See footnote in table 4.1 for variable definition.

b/ Dummy variable having value of 1 when observation is employed in the place indicated, and zero otherwise.

Source: NSO Labor Force Survey, 1989.

**Table A4.4: Private and social returns by levels of education, 1989 a/**  
(percent)

<u>Level of education</u>	<u>Private</u>	<u>Social</u>
Lower secondary	14.6	12.1
Upper secondary		
General	5.8	4.8
Vocational	14.7	11.2
Higher education		
Academic-BA	22.3	15.2
Vocational	5.8	4.1

a/ Based on earnings profile averaged over all sectors of employment and both sexes.

Sources: NSO Labor Force Survey, 1989.

**Table A4.5: Average monthly earnings by level of education and economic sector, 1986 and 1989 a/**

	<u>Private</u>			<u>Public</u>			<u>All sectors</u>		
	<u>1986</u>	<u>1989</u>	<u>% change</u>	<u>1986</u>	<u>1989</u>	<u>% change</u>	<u>1986</u>	<u>1989</u>	<u>% change</u>
Elementary	990 (264)	1,089 (243)	10.0	-	-	-	990 (264)	1,089 (243)	10.0
Secondary	1,561 (193)	1,659 (186)	6.3	2,035 (24)	2,799 (11)	37.5	1,613 (217)	1,723 (197)	6.8
Lower	1,432 (133)	1,565 (136)	9.3	2,040 (12)	1,616 (3)	-20.8	1,482 (145)	1,566 (139)	5.7
Upper	1,847 (60)	1,915 (50)	3.7	2,029 (12)	3,242 (8)	59.8	1,877 (72)	2,098 (58)	11.8
Vocational	2,706 (108)	2,964 (127)	9.5	2,387 (67)	2,605 (41)	9.1	2,584 (175)	2,876 (168)	11.3
Teacher training	2,362 (4)	3,445 (22)	45.9	3,227 (28)	3,127 (19)	-3.1	3,119 (32)	3,298 (41)	5.7
Higher education	4,986 (74)	4314 (62)	-13.5	3,837 (27)	3,997 (25)	4.2	4,679 (101)	4,223 (87)	-9.7

a/ Data reflect men's earnings; figures in parentheses refer to number of observations.

Sources: NSO Labor Force Surveys, 1986 & 1989.

**Table A4.6: Average monthly earnings by level of education and work experience, 1986 and 1989 a/**

	<u>Less than 6 years' experience</u>			<u>Less than 3 years' experience</u>		
	<u>1986</u>	<u>1989</u>	<u>% change</u>	<u>1986</u>	<u>1989</u>	<u>% change</u>
Elementary	870	993	14.1	683	762	11.6
Secondary	1,525	1,710	12.1	1,215	1,337	10.0
Vocational	2,444	2,611	6.8	2,060	2,536	23.2
Teacher training	2,769	2,976	7.3	2,340	2,585	10.5
Higher education	4,112	3,952	-3.9	3,627	3,682	1.5

a/ Data reflect earnings average over both sexes for all sectors of employment.

Sources: NSO Labor Force Surveys, 1986 & 1989.

Table A4.7: Pre-tax earnings functions of higher education graduates according to the type of institution and the field of study, Thailand 1985

	<u>Coefficient</u>	<u>t-stat.</u>	<u>Coefficient</u>	<u>t-stat.</u>
Male a/	0.263	17.4	0.221	13.8
Experience	0.082	22.9	0.084	24.7
Experience <sup>2</sup>	-0.001	10.8	-0.001	11.7
Bachelor with Honor a/	0.073	3.2	0.059	2.7
Double major a/	0.039	0.4	0.063	0.8
Type of University a/				
Prestigious public	0.135	6.9	0.152	5.5
Other public closed	0.004	0.1	0.043	1.4
Open	-0.095	3.1	-0.025	0.8
Technical, teacher	-0.109	2.4	-0.067	1.5
Private	--			
Father's Occupation a/				
Blue Collar	0.034	1.4	-0.019	0.1
White Collar	0.043	1.7	0.020	0.8
Farmers & Others	--		--	
Father's Education a/				
Secondary or above	0.033	1.8	0.033	1.9
Primary or less	--		--	
Field of Study a/				
Science			0.134	4.0
Agriculture			0.246	6.2
Fine arts			0.002	0.1
Sociology			0.154	5.7
Medicine			0.626	10.7
Medical technology			0.023	0.7
Business admin.			0.262	8.8
Law			0.066	1.9
Engineering			0.313	9.2
Architecture			0.316	5.7
Education & others			--	
Second job holder a/			0.297	16.5
Intercept	8.131		7.909	
R <sup>2</sup> (%)	0.361		0.424	
No. of observations	4,877		4,877	

a/ Dummy variable with value 1 when individual has the indicated attribute; 0 otherwise.

Source: supplied by NEC using data from the 1985 survey cited in NEC, 1989a.

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