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STRATEGIES FOR FINANCING HIGHER EDUCATION: THE CASE OF THAILAND

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Strategies for Financing Higher Education: the Case of Thailand[1]

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Introduction

Ninety years ago, the first university was established in Thailand. It was an elite approach to higher education with the main purpose to train government officials to run the country (Krongkaew, 2004). Since then the Thai higher education sector has experienced a remarkable development. Most notably, the number of higher educational institutions has increased to nearly 800 institutions with the total number of students enrolled reaching 2.5 million. Thus the Thai higher education sector has grown from an elitist to a mass economic and social institution.

The purpose of this paper is to discuss the main characteristics of the higher education sector in Thailand and review major policy developments with a special focus on how the country's higher education financing system has changed during the past decade. In particular, the paper will discuss the roles of student loan arrangements in funding higher education and assess its effectiveness.

Section 1 discusses major developments of the Thai higher education sector during the last decade. Section 2 explores the role of the government in financing higher education and its effects on efficiency and equity of the system. Section 3 describes the Student Loan Fund, the most important student loan scheme in Thailand, and provides an empirical assessment of its impacts. The final section summarizes the main findings of the paper and provides some policy recommendations.

1. Overview of Thai higher education sector

Some key features of the Thai higher education system should be noted at the outset. Firstly, even among East Asia countries that are well known for their emphasis

[1] We would like to thank Professor Bruce Chapman for his insightful comments on an early draft of the paper.

on education, Thailand has a relatively high rate of participation in higher education. With 41 percent of the gross enrollment ratio, the country ranks second only to Japan and higher than Malaysia and Hong Kong, both of which have higher income per capita (see Figure1).

This high level of enrollment was a result of a rapid expansion of the sector in the last decade. As shown in Figure 2, the enrollment ratio has nearly doubled from 22 percent in 1996 to 43 percent in 2005. As we will argue later, changes in the supply side are the main driving forces of the expansion.

Another key feature of the Thai higher education system is that the public sector plays a very dominant role in education provision; with over four-fifths of the total students enrolling in public institutions (see Figure 3). Institutions in the public sector are administratively classified into (1) universities with limited admission, (2) open universities, (3) autonomous universities, (4) Rajabhat Universities (former teacher's colleges), (5) Rajamangala Universities of Technology (former vocational colleges) and (6) public vocational colleges. These public higher educational institutions receive most of their funding from the government and a much smaller portion from tuition fees and other sources.

During the past three decades, continued efforts have been made to transform major limited admission public universities into autonomous ones. The purpose of such attempt is to provide administrative flexibility to these universities, aiming at enhancing their quality to an international level (Kirtikara, 2004). However, so far only seven public universities have been successfully transformed and a few more are in the pipeline.

Due to the domination of the public sector, private educational institutions play a relatively minor role in education provision. These institutions consist of private Thai universities, vocational colleges and international institutions. International institutions are still marginal players with a share of only 0.05 percent of the total students due to a number of reasons, including the legal restrictions on foreign ownership of educational institutions.

The increase in enrollment during the last decade was mainly driven by the rapid expansion in production capacities of many limited admission universities and Rajabhat Universities through the opening of 'special programs'. As these programs

can charge high tuition fees, they are easy solutions to the lecturers' calls for higher compensations[2] and the universities' needs to diversify their income sources away from government budget to prepare for the transformation towards autonomous universities. In addition, two new limited admission universities were also established. The expansion of the Rajabhat Universities and limited admission public universities has come at the cost of the open universities while the number of students enrolling in private institutions in absolute term remains virtually unchanged (See Figure 4). In relative term, however, the student share of private institutions has decreased from 24 percent in 1996 to 17 percent in 2006 (Figure 5).

To understand the sources of growth in enrollment from the demand side, we classify new higher education students into the group of new high school graduates (i.e. those just graduated from high schools in the previous academic year) and the rest (i.e. adult students and graduates from non-formal education system). The analysis shows that while new high school graduates still remain the majority by a large margin, there is a recent increase in the participation of adult students and those graduated from the non-formal system (Figure 6). Most of these students enroll in Rajabhat Universities or special programs provided by limited admission universities (Figure 7).

There are at least two reasons for the dominating role of the public universities. Firstly, many public universities were established decades before the private ones and thus are much better known. Secondly, due to their limited admission policy and the competitive entrance examinations, public universities can attract the best and brightest high school graduates, which in turn reinforce their prestige. Finally, public universities have long been heavily subsidized by the government and thus can charge lower tuition fees, at about half or even one fourth of the fees charged by private institutions (see Table 1), making them much more attractive from the perspective of the students.

Another consequence of the rapid expansion of the Thai higher education sector is that the share of social science and humanity students has continued to

[2] According to our interviews with public university's instructors, a lecturer who teaches a special program may earn 90,000 baht (US$ 2500) per month, which is more than four times his or her monthly salary.

increase from an already high level, reaching 73 percent of the total number of students in 2007 (Figure 8). This is because the investment cost for training social science and humanity students is much less than that of the physical and medical science students[3].

2. Problems of the current education financing system

Participating in higher education is a form of investment that can generate high return. Using the Labor Force Survey data for 2001-2003, Punyasavatsut et al (2005) estimated that the rates of return on higher education were significantly higher than that of secondary education (Table 2).

However, due to imperfections in the capital market, not all high school graduates can participate in higher education, especially those from low income families. Using the 2002 Child and Youth Survey data, we found that high school graduates that replied in the survey that they would not enroll in higher education were mostly from low-income families. Two major reasons cited by them were the lack of financial resources and the need to earn a living (Table 3), both of which reflect their financial constraints.

The inability of low income families to finance investment in higher education has implications for economic efficiency in that the investment in higher education is below an optimal level. It also has equity impacts in that low income families are under-represented in higher education. As a result, government intervention is often required to correct this market failure. In the case of Thailand, the higher education market is intervened by the government through subsidization of public educational institutions and student loans.[4]

Public fund accounts for nearly 80 percent of the total funds for education in Thailand. In fact, education expenditures have been the largest component of the government's budget, ranging from 20 to 26 percent of the total budget, or between 3.6 and 4.5 percent of the GDP (Punyasavatsut et al, 2005). Higher education

[3] To put into perspective, the proportion of social science and humanity student in Thailand is slightly larger that of the OECD average, which is about 68.5 and 53 percent for female and male graduates, respectively.

[4] There are also the grants in the form of scholarships to students, but their sizes have been marginal comparing with the sizes of loans and subsidies.

expenditure ranges from 3.1 to 4.3 percent of total education budget, and 0.7 percent of the GDP, and has been relatively constant in the last decade (see Figure 9).

Although significant amount of public money has been allocated to the higher education sector, the sector's finance still suffers from a number of problems. Firstly, it is mainly a supply-side financing system that cannot flexibly respond to the changes in students' needs. This is because most of the resources are channeled to producers of education services, i.e. universities and other higher educational institutions. A breakdown of government expenditure in Figure 10 shows that, approximately 80 percent of public expenditure goes to higher educational institutions, while the rest is used for student loans.

Secondly, the rapid growth in participation in higher education has exerted a lot of pressure on the current education financing system. In particular, the growth of budget on education expenditures has not kept pace with the growth in number of students enrolled (Figure 11). As a result, public expenditure on education per student has experienced a long-term downward trend (Figure 12). Since education investment has an impact on education quality, there is a risk of quality deterioration unless there were other financial resources that grew sufficiently quick.

Thirdly, enrolling in public higher education institutions is highly subsidized by the government, as a result of tuition fees that are set much below the actual costs. A study by the King Mongkut's University of Technology Thonburi (KMITT, 2005) found that, on average, a social science student is subsidized by 57 percent of the operating cost while a public-health student is subsidized by 77 percent (see Table 4). Since the poor are generally under-represented in higher education, subsidization of higher education in this way is likely to be regressive. Based on a benefit incidence analysis, we found that subsidy per capita actually grows with household income (Table 5).

Thus there has been an urgent need to reform the Thai financing system for higher education. Experiences in other countries have shown that a properly designed student loan can provide a solution to the aforementioned problems.

3. Student Loans Scheme in Thailand

In addition to the direct provision of higher education by public institutions, the Thai government has also provided loans to students since 1996. This section will discuss the Student Loans Fund (SLF), so far the most important student loan scheme in Thailand, analyze its effectiveness and assess its financial sustainability.

3.1 Settings of the Student Loans Fund

The main objective of the SLF is to increase the opportunities of students from low-income families to continue their study. Other objectives are to promote more equal income distribution in the long run and to develop a demand-side financing system by increasing the capacity of households to contribute more resources to education. The SLF loans cover tuition fees, educational related expenses and other living expenses. Only high school or tertiary-level students whose families' incomes are under 150,000 baht per year are eligible to apply for the loan. During the first ten years of its operation, the SLF has lent to more than 2.6 million students, with the loan value totaling nearly 200 billion baht.

Organization Structure of the SLF

Figure 13 shows the administrative structure of the SLF. At the top of the structure is the SLF Board, chaired by the Permanent Secretary of the Ministry of Finance. The Board has an authority to set student loan policies and related regulations, and to decide the amount of budgets and administrative costs to allocate to related agencies. The SLF budget for loan is then divided into two portions: one for upper secondary level (high school and vocational school), which is supervised by the Sub-Committee on the First Expense Account; another for undergraduate level, which is supervised by the Sub-committee on the Second Expense Account. The Krung Thai Bank, a major commercial bank owned by the government, has been hired to disburse the approved loans and collect repayments.

Loan application and approval procedures

The annual cycle of loan disbursement starts when the Sub-committees on the First and the Second Expense Accounts allocate the approved budgets to educational institutions under their supervision. These institutions then call for loan applications from their students before the beginning of a new semester. A committee in each institution then selects students to lend to by examining their applications and interviewing them. The time from loan application to the first loan disbursement

normally takes at least three months. As a result, selected students usually get their first tranche of loans near the end of the first semester.

Contrary to its objectives, the SLF still operates in a supply-side manner since all major decisions rest with the government committees and school administrators. Students will not be able to apply for loans before they are accepted by an educational institution. In addition, since the SLF loans are open to competition, applicants cannot be guaranteed that they would be selected for loans and, in case of being selected, would be able to borrow the full amount they requested. In fact, the amount of loan a student can borrow depends on three factors: 1) the overall loans allocated to his or her educational institutions, which is not directly linked to his or her financial needs, 2) the level of loan competition in his or her education institution and 3) the discretion of his or her school's authorized committee. This creates a high degree of uncertainties for applicants in need of financial support and is likely to be a barrier for them to enroll in higher education.

Loan ceilings

The ceiling of loan for borrowing students is determined according to their educational levels, fields of education and types of expenses (Table 6). For example, the ceiling for a high school student is currently set at 26,000 baht per year, while that of a vocational school student is 36,000 baht per year. The maximum loan for an undergraduate student depends on the field of education, ranging from 84,000 baht per year for social sciences, arts and humanities to 174,000 baht per year for medical sciences.

Debt Repayment

Under the current scheme, borrowers have to begin to repay their debts two years after their graduation or after they stop borrowing, regardless of their income level. The rates of repayment are set progressively according to a pre-specified percentage of the total loan size as shown in Table 7. The total repayment period is 15 years, with no interest charged in the first year. Borrowers are then charged 1 percent interest rate of the outstanding loan in that year for the rest of the repayment period. It is important to note that interest is not charged before the repayment period and that even when it is charged, the rate is much lower than the commercial lending rates and the government's cost of capital, meaning that the government has to subsidize the

interest rate. However, borrowers would be penalized at the rate of 12 to 18 percent of the installment loan for failure to repay their debts on time. Deferral of payment up to 2 years is allowed on a case-by-case basis if the borrowers can prove that they had incomes below 4,700 baht per month or had been negatively affected by natural disasters, wars or riots. In addition, the outstanding debts would be forgiven if the debtors decease or become handicapped.

3.2 Impacts of student loans on educational opportunities

Although the SLF has been in operation for over a decade, there has been no systematic evaluation of the scheme. In this section, we will present our empirical assessment of the impacts of the SLF by answering two questions: 1) to what extent did the loans reach the target group?, and 2) to what extent did the SLF increase educational opportunities of the borrowers?

Description of Data

The data used for evaluating the impacts of the SLF is from the Child and Youth Survey, which has been undertaken by the National Statistical Office every five years since 1974. These nationwide surveys cover information on education, employment status, leisure and social participation of children and the youth, defined as those between 3 and 24 years old. In our study, we use the latest round of survey in 2002, which is the only round that was conducted after the full implementation of the SLF program[5]. We distinguish SLF's borrowers and non-borrowers based on their answers to the question on the major source of fund for their educational spending. As the survey did not ask directly whether a student borrowed from the SLF, there was a possibility of misclassifying some borrowers who had other sources of funding for their educational spending as non-borrowers. However, we believe that the probability of such misclassification is low and is unlikely to cause problems for our analysis due to two reasons. Firstly, supports for tuition fee, which constitutes a significant portion of the SLF loan, are transferred directly from the SLF to education institutes, making it impossible for students to use funding from other sources to pay their tuition fees. Secondly, the group with greatest potentials for misclassification, the borrowers from high-income households whose educational spending were financed mainly by their

[5] In fact, there is a previous survey conducted in 1997, right after the implementation of the SLF. However, since the sample size of the students participated in the SLF was very small in the 1997 survey, we consider it is more appropriate to use the 2002 survey for our study.

family supports, are excluded from the matching analysis, as we limit the sample to include only students with household incomes not exceeding 150,000 baht per year.

There are 275 out of 8,290 students who answered that their major source of educational expenditure was the SLF's loan.

Distribution of loans to the target group

To begin with, it is natural to ask whether the SLF loans have actually reached the target group, i.e. the students from families whose annual income is less than 150,000 baht per year. To answer this question, we rank the students by their average household income and divided them into 5 groups. Table 8 shows that, for upper secondary students, the SLF loans were targeted quite successfully to the intended group; only 7 percent of total borrowers were not in the target group. For undergraduate students, however, there were nearly 19 percent of the borrowers that were not in the target group.

These results indicate that the screening process of borrowers at the undergraduate institutions was much less effective than that of high schools. Our interviews with loan personnel of high schools and universities reveal that the former tend to have more information about the actual economic status of their students than the latter due to closer contacts with the students' families. This may be the main reason for the differences in effectiveness of the screening.

Evaluation of impacts on educational opportunity

As discussed in the previous section, there are some evidences that support the view that financial barriers prevent many high school graduates from low-income families from participating in higher education. Theoretically, the SLF should help reducing these financial barriers and thus promotes greater participation in higher education.

To evaluate the impact of the SLF, we need to compare the actual outcome of having the SLF with the outcome of what would have happened in its absence, or the counterfactual. The key challenge is to construct a good counterfactual that permits us to compare participants (treatment group) and non-participants (comparison group) of the SLF. Ideally we would like to compare the rate of higher education enrollment of high school students that borrow from the SLF with that of the non-borrowers. This comparison requires a panel data that tracks a given group of students over time,

which is unavailable in Thailand. Fortunately, the Child and Youth Survey contains one question that asks whether a student borrows from the SLF and another that asks whether he or she intends to enroll in higher education after graduation. Combining the answers to both questions, we can assess the impacts of the SLF in influencing students to enroll in higher education by a technique called matching.

Methodology

We adopt the Propensity Score Matching (PSM) technique to evaluate the impacts of the SLF program. The concept of PSM in our study is to find a comparison group which has the most similar profile to the borrower group except that they did not borrow from the SLF. This technique can help solve the selection bias problems that are likely to occur in naive comparison of borrowers and non-borrowers. For example, it is likely that students who borrow from the SLF come from low-income families since the loan was designed to target poor families. Moreover, the poor generally have less educational opportunity than the rich. As a result, naively comparing the educational opportunity of borrowers and non-borrowers is likely to underestimate the impacts of the SLF in increasing educational opportunity for the poor.

The PSM technique reduces the selection bias due to observable characteristics such as household income by selecting an individual in the comparison group who has a probability, known as "propensity score", to borrow close to that of an individual in the borrowing group. Without panel data or randomized experiment, however, we could not properly deal with selection biases due to unobservable characteristics such as personality of a student that might be used as a selection criterion during the interview but was not encoded in the data.

To assess the impacts of the SLF, the following steps were undertaken.

1) Final year students of the upper secondary level (grade 12 students) are selected as the samples for the analysis.
2) The propensity score to borrow of each sample is estimated by a logit regression by using variables considered to affect the probability of borrowing based on economic theory and in-depth interviews with school authorities regarding the selection process. The explanatory variables are 1)

household income, 2) education attainment of the head of household, 3) the number of persons who are financially dependent in the household, 4) sex, 5) age, 6) types of educational institution (public or private), 7) field of education (academic or vocational), and school location (rural or urban). See the appendix for results of the logit regressions.

3) A comparison group is selected from the sample based on a number of matching methods (see appendix). The treatment group and the comparison group are compared along a number of dimensions to ensure that the risks of selection bias are reduced by the matching process. As the 5-nearest neighbors matching method resulted in the most similar comparison group, it is adopted as our matching technique.
4) The impact of SLF is estimated by comparing the intention to attend higher education institution of students in the treatment and the comparison groups. The difference derived from the comparison is called the Average Treatment Effect for the Treated (ATT).

While there maybe other possible specifications of the model to estimate the propensity scores, our simple model seemed to have produced a result that satisfied the balancing property (as shown in tables in the Appendix), which is considered to be very important for matching techniques (Vandenberghe and Robin, 2004; Dehejia and Wahba, 1998).

Results

Table 9 presents the estimated impacts of the SLF on the intention to attend higher education of the final year high school students. The result shows no significant differences between the two groups. Other matching methods also produced similar results, showing the robustness of our finding. Thus it is found that the SLF has no significant impacts on the intention of borrowing students to participate in higher education.

Although it is found that the SLF has no significant impacts on the overall borrower group, it may have some impacts on some subsets of borrowing group, especially low-income subsets. To test this hypothesis, we divide the sample into four subsets by household income into 1) those with household income not more than

30,000 baht per year, which is close to the official poverty line of 28,650 baht[6], 2) those with household income between 30,000 and 60,000 baht per year, 3) those with household income more than 60,000 baht per year, and 4) those with household income not more than 150,000 baht per year, as set by the SLF's condition. The results in Table 10 show that the intention to attend higher education for the treated subset with household income less than 30,000 baht per year is significantly higher than that of the comparison group by nearly 9 percentage points. However, no significant differences for other subsets were found.

In summary, the SLF seems to have increased the educational opportunities of only the borrowers from families with income below the poverty line. Since this group constitutes only 13 percent of the total borrowers, the income threshold set by the SLF appears to be far too high.

3.3 Financial sustainability of the SLF

We now turn to the issue of financial sustainability of the SLF. In this section, we will investigate the issue based on the approach used by Ziderman (2002).

Repayment ratio

Based on the information about the repayment conditions described above, we estimate the SLF's repayment ratio, which assumes that all borrowers repay on time exactly according to the schedule set by the SLF (Table 7). Based on a discounted cash flow calculation using various discount rates and assuming a constant inflation rate of 3 percent per year, repayment ratios are estimated (Table 11). It can be seen that the repayment ratios are lower than half in all cases, ranging from 24 to 42 percents, depending on the period of borrowing and the discount rate used. Our results are broadly consistent with Sarachiti et al (2008) that estimates the implicit subsidy of the current SLF scheme to be 67 percents[7].The low level of repayment ratios (or high implicit subsidy) reflect the generosity of the SLF's repayment conditions: the long grace period, the low interest rate and the long repayment period allowed.

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[6] The official poverty line is 1,190 baht per person per month (Jitsuchon et al, 2004). We assume that there are two income earners in a family: the head of household and his or her spouse. Hence, the household income at the poverty line is 28,560 baht per year.

[7] Sarachiti et al (2008) also analyze the implicit subsidy of alternative SLF schemes by varying the terms of grace periods and interest charged. They found that interest rate subsidies were the most important parts of government subsidies.

Recovery ratio

The repayment ratio assumes that loans are repaid according to the set conditions. In addition to ignoring the administrative costs of the SLF, it also fails to take into account the fact that many borrowers would not repay on time and may even default on their loans. Table 12 shows the percentage of borrowers that did not repay on time. For instance, it shows that among the group of borrowers that are scheduled to repay in 2001, 54.8 percent did not repay on time. This reflects a poor repayment collection mechanism of the SLF. Since the operation of SLF has not been long enough to reliably estimate the actual default rate, we assume the rate to be in the range of 10 percent based on the SLF's estimation and 30 percent based on our estimation using the 2005 repayment data. The administrative cost is estimated to be 1.6 percent of the total outstanding debt.

Table13 shows that the SLF has very low recovery ratio, ranging from 25 to 35 percent. Thus, the fiscal burden of the SLF can be very high in the long run unless the repayment conditions are changed or the repayment collection system is strengthened.

3.4 Shifting to Income Contingent Loan (ICL)

The SLF was temporarily abolished and replaced by the Income Contingent Loan (ICL) scheme under the Thaksin government in 2006. The ICL, which was modeled after the loan with the same name in Australia, is different from the SLF in many important ways. Firstly, it allows only undergraduates but not high school students to borrow. In addition, it sets no condition on household income of the borrowers. This means that all undergraduate students in any fields can apply for loan. Secondly, it covers only tuition fees, not other education related expenses and living expenses. Thirdly, it does not require the borrowers to start repaying until their incomes reach 16,000 baht per month (minimum income level for the payment of income tax). The repayment rate is contingent upon the borrowers' incomes, and is progressively increased with higher income. Fourthly, there is no interest charged under the ICL scheme, but the outstanding debt will be adjusted by inflation from the first year of borrowing. Finally, the revenue department is responsible to collect the repayment.

Even though its supporters claimed that the ICL is far more superior to the SLF in many aspects, the ICL was short lived when the Surayud Administration, which

succeeded the Thaksin Administration, decided to put the SLF back in place in 2007. Critics claim that, regardless of many improvements brought about by the ICL, the scheme is too fiscally expensive, especially when the enrollment in higher education is expanding. The status of the ICL and the SLF face uncertainty again now that a new government backed by Thaksin has regained power in early 2008.

4. Concluding remarks

The Thai higher education sector has expanded quickly during the past decade, making a transition from an elitist to a mass institution. To cope with the enrollment expansion, the education financing system needs to be reformed. The current system of public subsidy to public educational institutions has proved to be inefficient, regressive and anti-competitive. The introduction of the SLF was supposed to be a step forward. Carefully designed, it has a potential to be more efficient, fairer, and more pro-competition. However, the current SLF scheme contains too many flaws: it loan screening system is far from perfect; it fails to disburse the loan on time; it has a very poor collection mechanism and it is still based on the supply-side financing paradigm. Our analysis shows that it could not significantly influence the decisions of high school students to continue their studies to a higher level, except for the poorest group who were minority among the recipients. In addition, the SLF is suffering from a serious financial sustainability problem due to its very low recovery rate.

The shift to the ICL had brought about many important improvements, especially a potentially more effective repayment collection system. Moreover, it is based on a demand-side financing paradigm that promotes more choices for students. However, the ICL is not without its problems; it still unnecessarily subsidizes the borrowers by charging zero real interest rate. In addition, the ICL by itself cannot bring about the overall changes to the educational financing system unless other reforms are also undertaken.

More importantly, policy certainty is pre-requisite to a long term development of the system. Frequent policy reversals will not only bring about confusions to all stakeholders but will also raise questions about the government's commitment to any loan programs. To prevent haphazard policy changes, policy makers should seek consensus from broad-based stakeholders before making any major policy changes.

Finally, we recommend the government to regularly evaluate its loan schemes. We also call for an improvement in data collection by improving the survey questionnaire and by constructing panel data sets that enable better policy evaluations.

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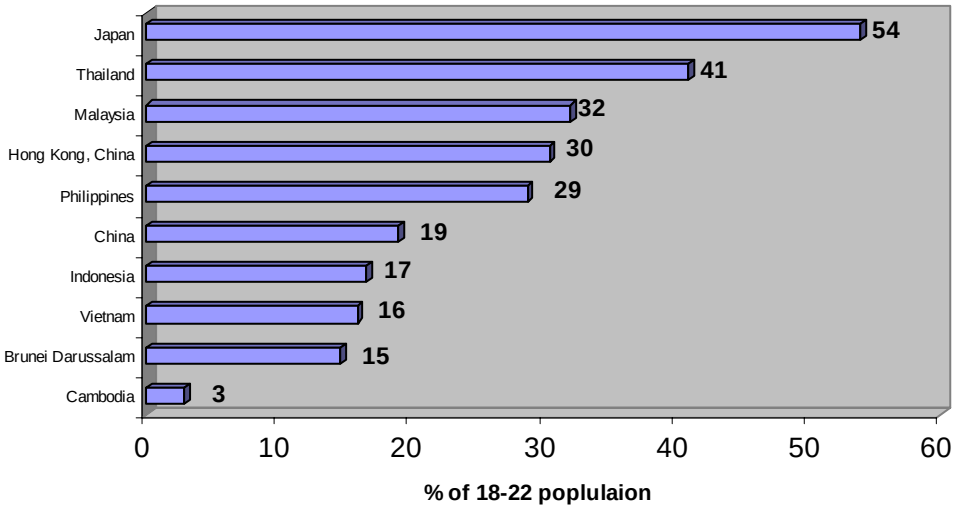
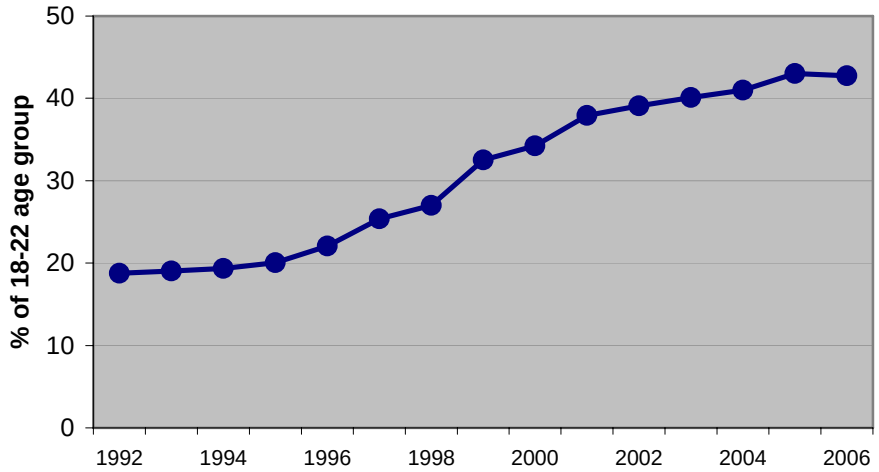
Figure 1 Gross enrollment ratios in higher education of selected East Asian countries (2004)



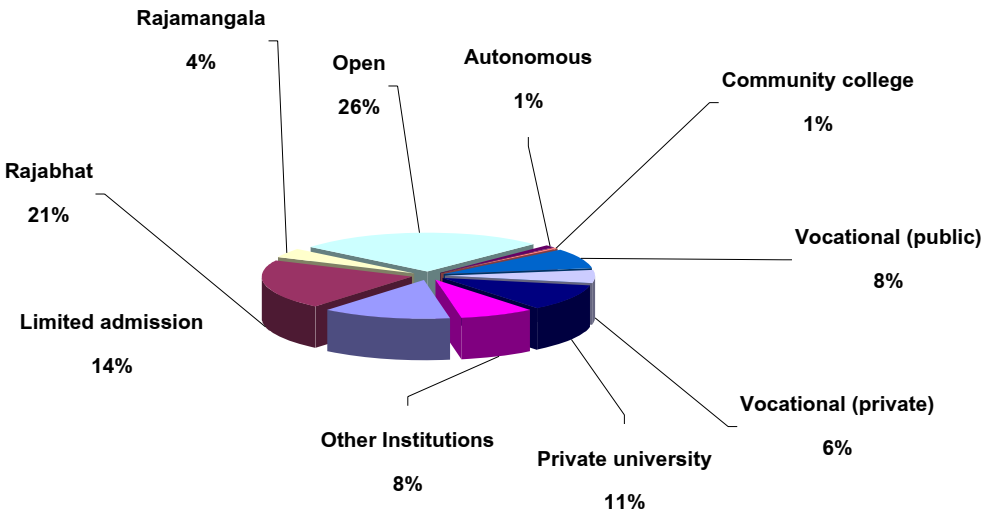
Source: Edstats, the World Bank

Figure 2 Changes in the gross enrollment ratio of higher education in Thailand, 1992-2006



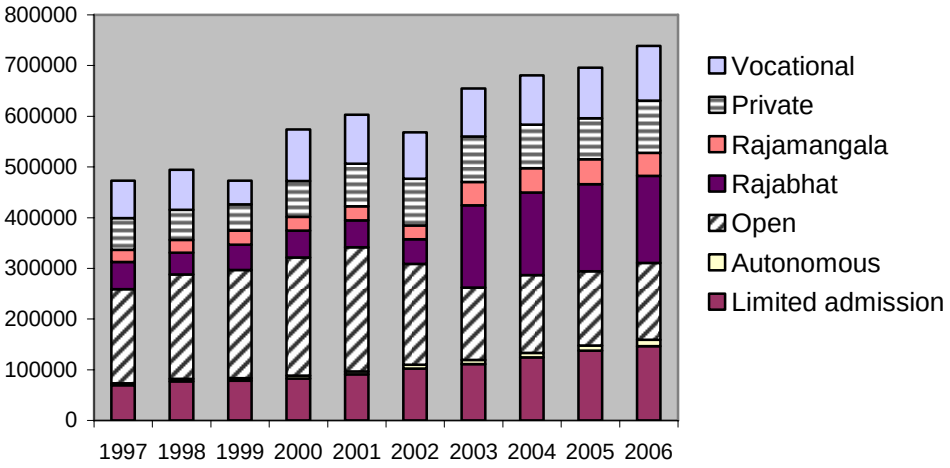
Source: Edstats, the World Bank

Figure 3 Student shares by types of education institutions, academic year 2006



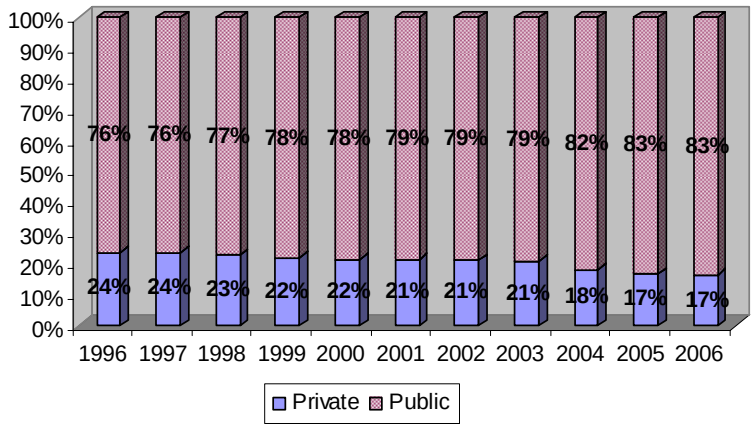
Source: Education Statistics, Ministry of Education

Figure 4 New students classified by type of institution, 1997-2006



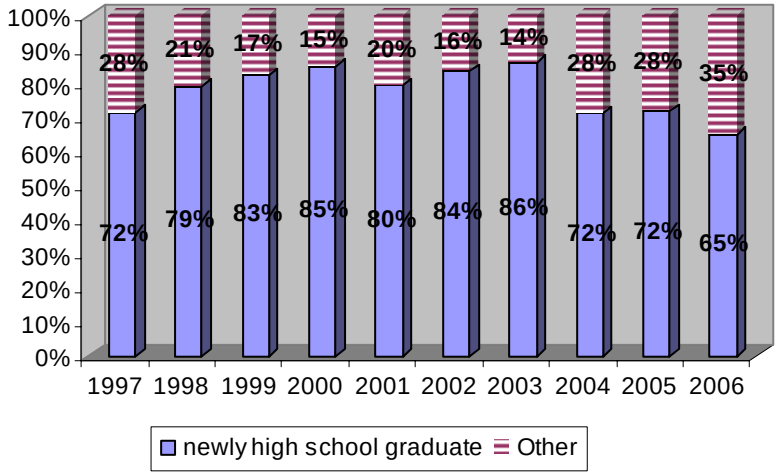
Source: Education Statistics, Ministry of Education

Figure 5 Changes in student shares of public and private institutions, 1996-2006



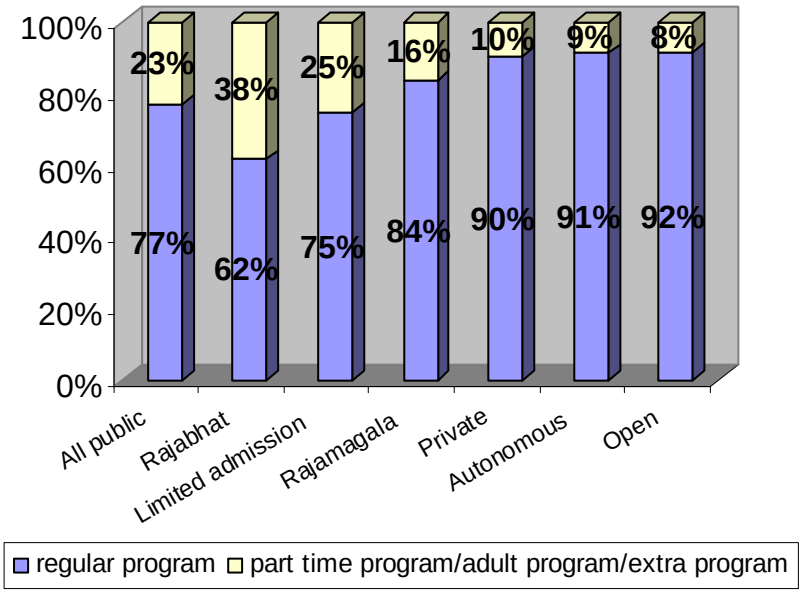
Source: Education Statistics, Ministry of Education

Figure 6 Composition of new enrollment in higher education, 1997-2006



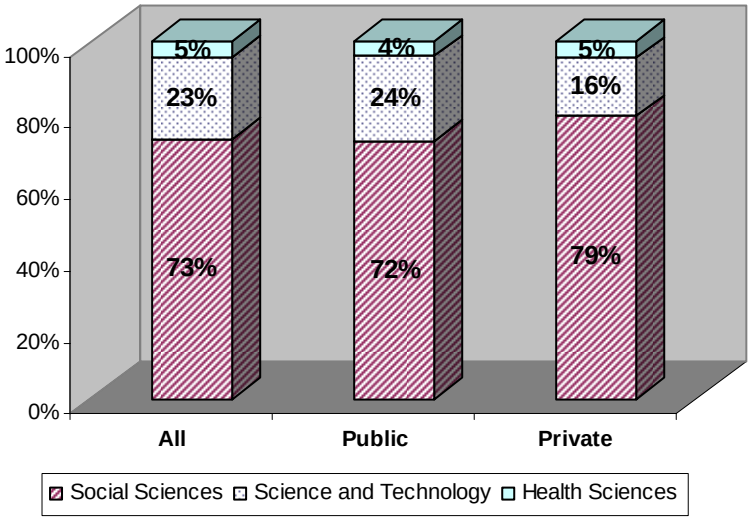
Source: Education Statistics, Ministry of Education

Figure 7 New enrollments by type of study program, 2007



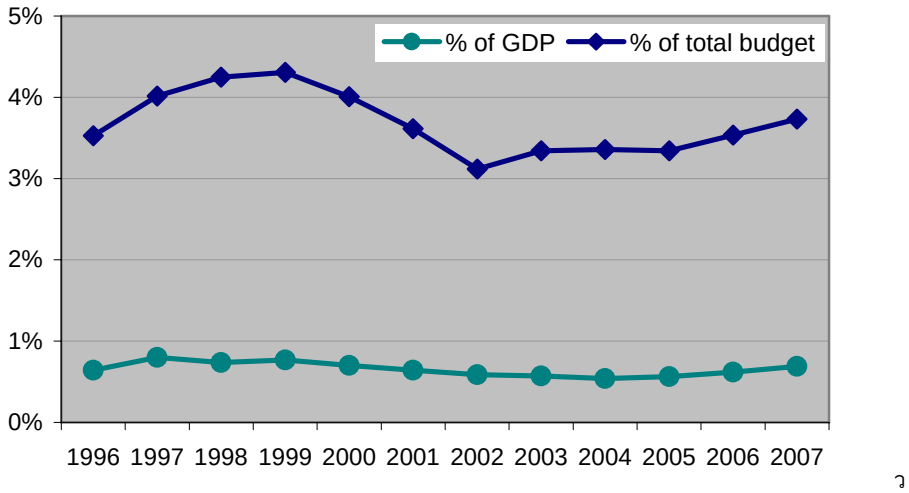
Source: Education Statistics, Ministry of Education

Figure 8 Total enrollments by field of education, 2007



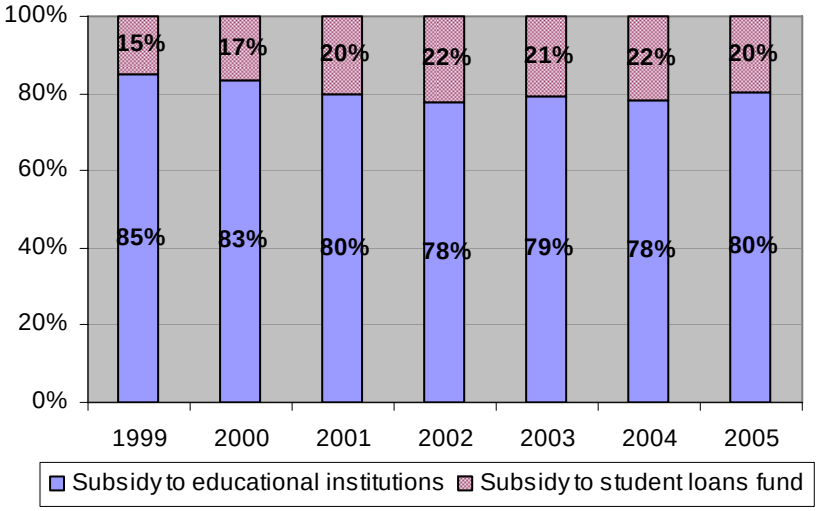
Source: Education Statistics, Ministry of Education

Figure 9 Public expenditure in higher education, 1996-2007



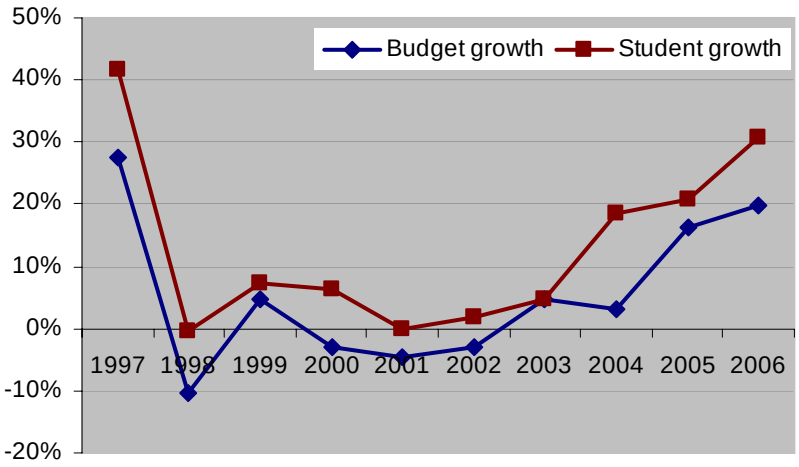
Source: Budget in Brief (calculated from nominal values)

Figure 10 Composition of government supports to higher education, 1999-2005



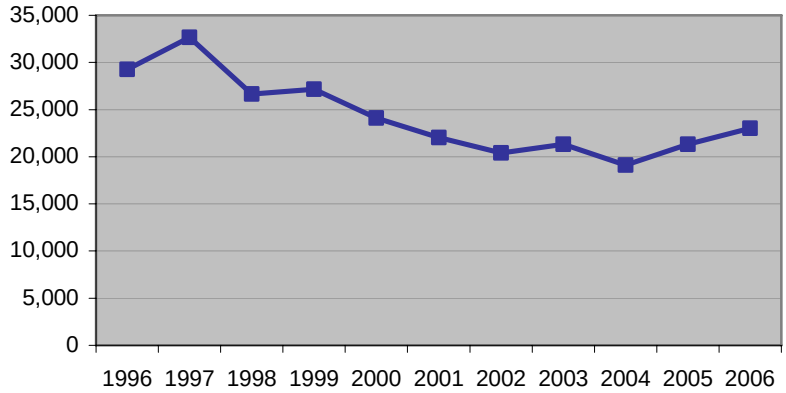
Source: Commission on Higher Education and Office of the Student Loans Fund

Figure 11 Growth rates of students and budget, 1997-2006



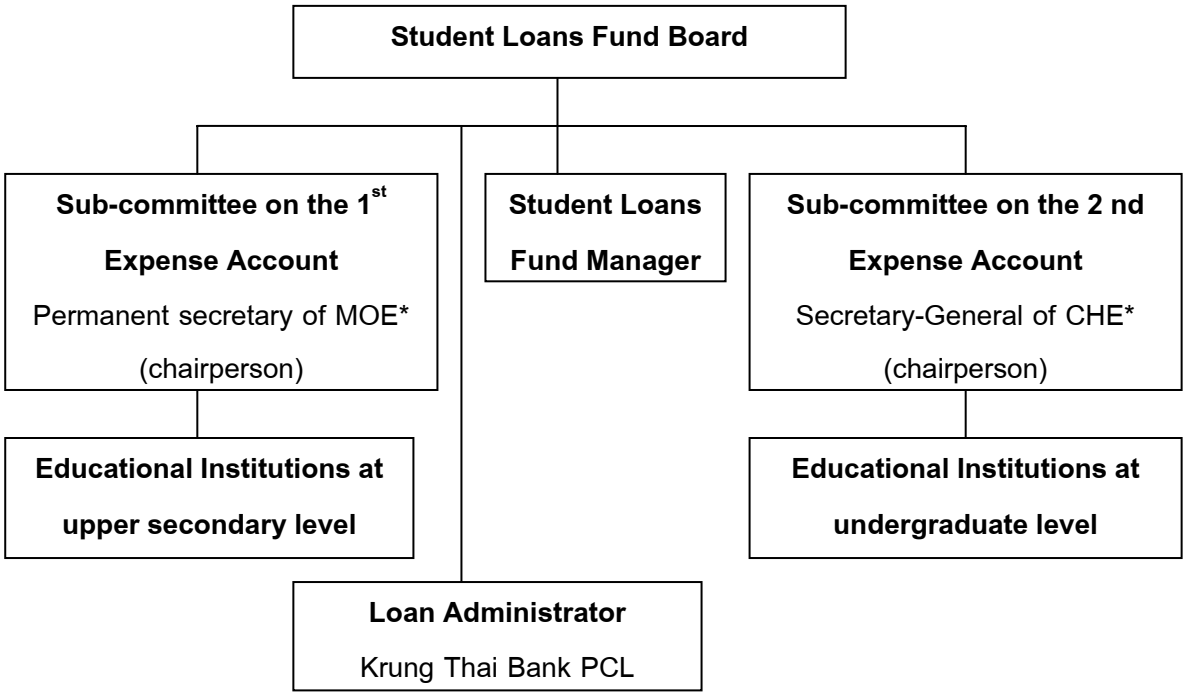
Source: Budget in Brief and Education Statistics (calculated from nominal values)

Figure 12 Public expenditure per student (baht/year), 1996-2006



Source: Budget in Brief and Education Statistics

Figure 13 Organization structure of the Student Loans Fund



Note: *MOE: Ministry of Education
****CHE: Commission on Higher Education, under Ministry of Education**
Source: Student Loans Fund officer's handbook (2005)

Table 1 Tuition fees for bachelor degree (US$)

Types of institution	Courses	Tuition fee (per year)		
		Minimum	Maximum	Median
Public institution				
Limited admission university	Science and Technology	147	1,224	387
	Health Sciences	144	723	395
	Social Sciences	152	578	291
Autonomous university	Science and Technology	546	1343	673
	Health Sciences	701	728	710
	Social Sciences	546	658	651
Open university	Science and Technology	47	994	99
	Health-Science	93	106	99
	Social Sciences	46	96	82
Private institution				
Private university	Science and Technology	731	2,571	1,684
	Health Sciences	1,302	4,683	1,766
	Social Science	568	1,907	1,072
Private college	Science and Technology	1,079	2,028	1,376
	Health Sciences	1,398	1,979	1,580
	Social Sciences	523	1,547	972

Note: Tuition fees are converted from Thai baht to US dollars using the 2003 exchange rate (US$ 1 = 41.5 baht)
Source: Weesakul et al, 2003

Table 2 Estimates of rates of return on education (percentage)

Educational level	2001		2002		2003	
	Female	Male	Female	Male	Female	Male
Secondary school (academic)	14.74	20.80	14.22	19.14	15.81	18.72
Secondary school (vocational)	9.95	11.31	5.55	10.74	7.96	8.82
University, comparing with secondary school level (academic)	16.34	20.40	17.77	20.25	17.51	19.94
University, comparing with secondary school level (vocational)	13.51	15.67	13.21	16.05	13.58	15.06

Source: Punyasavatsut et al (2005)

Table 3 Reasons cited for not enrolling in higher education

Reasons	Percentage
Lack of financial resources	71
Have to earn one's living/household's living	16
Have enough skill/knowledge for one's career	8
Sick/disability	1
Other	4

Source: Authors, from the Child and Youth Survey (2002)

Table 4 Public subsidy as percent of the total operating cost in educating a student

Field of education	Mean	Maximum	Minimum
Public health	77	93	29
Agriculture	76	94	56
Fine Arts/Architecture	69	94	24
Engineer/Science	67	93	29
Medical sciences	63	91	28
Social sciences/Arts	57	89	17

Source: King Mongkut's University of Technology Thonburi (2005)

Table 5 Benefit incidence of public education spending by income group, 2006

decile	Per capita subsidy (baht)		
	All Levels	Primary and Secondary Education	Higher Education
1 (poorest)	11,188	11,148	40
2	14,860	14,687	173
3	15,751	15,428	323
4	17,744	17,277	467
5	18,891	18,128	763
6	20,725	19,541	1,184
7	21,974	20,145	1,829
8	23,173	20,436	2,738
9	25,616	21,380	4,237
10 (richest)	28,959	22,009	6,950
total	19,889	18,018	1,871

Source: Authors, from Socio-Economic Survey and the Bureau of the Budget

Table 6 Loan ceiling by educational level and type of expense (baht/person/year)

Educational level/Field of education	Tuition fee & Education-related expenses	Living expense	Total
1.High school	14,000	12,000	26,000
2.Vocational certificate	21,000	15,000	36,000
3.High Vocational certificate/Associate degree			
3.1 Business administration, Arts, Agriculture, Domestic science, Tourism	25,000	20,000	45,000
3.2 Manufacturing, Information Technology, Communication,	30,000	20,000	50,000
4.Undergraduate			
4.1 Social sciences, Arts, Humanities, Education	60,000	24,000	84,000
4.2 Architecture	60,000	24,000	84,000
4.3 Engineering, Sciences and Technology	70,000	24,000	94,000
4.4 Agriculture	70,000	24,000	94,000
4.5 Public health, Nurse, Pharmacology	80,000	24,000	104,000
4.6 Medical science, Veterinary, Dentistry	150,000	24,000	174,000

Source: Office of the Student Loan Fund (2007)

Table 7 Repayment rate of the SLF

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	**Total**
Repayment (% of loan)	1.5	2	3	3.5	4	4.5	5	6	7	8	9	10	11	12	13	100

Source: Office of Student Loans Fund (2007)

Table 8 Number of students borrowing from the SLF, classified by household income

Household income (baht/year)	Number of student (person)	Number of borrower (person)	Share of total borrower (percentage)
Upper secondary level			
0-50,000	1,698	69	54.76
50,001-100,000	1,857	35	27.78
100,001-150,000	1,070	13	10.32
150,001-200,000	170	0	0.00
More than 200,000	1,230	9	7.14
Total	**6,025**	**126**	**100.00**
Undergraduate level			
0-50,000	348	43	28.86
50,001-100,000	647	53	35.57
100,001-150,000	466	25	16.78
150,001-200,000	89	5	3.36
More than 200,000	715	23	15.44
Total	**2,265**	**149**	**100.00**

Source: Authors, estimated from the Child and Youth Survey data (2002)

Table 9 Impact of the SLF on the intention of high school students to enroll in higher education

Outcome	5-Nearest Neighbors Matching				Without matching			
	Treatment Group	Comparison group	ATT	t-value	Treatment group	Non-borrower group	Difference	t-value
Intention to advance to higher education	95.65%	94.78%	0.87%	0.23	95.65%	96.35%	-0.7%	-0.23

Table 10 Impact of the SLF on intention to attend higher education institutions, by household income

Sample group classified by Household income (baht/month)	Intention to attend higher education institutions			
	Treatment group	Comparison group	ATT	t-value
income ≤ 30,000	100%	91.16%	8.84%**	3.39
income between 30,001 and 60,000	88.89%	94.44%	-5.56%	-0.26
income > 60,000	100%	94.55%	5.45%	1.21
income ≤150,000	95.76%	96.77%	-1.0%	-0.24

Note: ** significant at the 95% confident level
Source: Authors, estimated from the Child and Youth Survey data (2002)

Table 11 Ideal repayment ratios (%)

Borrowing period	Discount rate		
	4%	6%	8%
Upper secondary level (3 years)	41.81	33.22	26.65
Undergraduate (4 years)	40.48	31.82	25.27
Upper secondary plus undergraduate (7 years)	40.79	30.88	23.61

Table 12 Percentage of borrowers who did not declare for obligatory repayment

Year	Borrowers who did not declare for repayment by compulsory year						
	1999	2000	2001	2002	2003	2004	2005
2001	19.58	23.98	**54.80**				
2002	17.99	22.59	32.32	**56.85**			
2003	15.96	20.03	27.24	36.06	**57.44**		
2004	12.45	19.26	26.06	33.02	39.94	**55.61**	
2005	9.98	15.4	23.32	32.06	38.27	36.17	**56.87**

Source: Office of the Student Loans Fund

Table 13 Estimated recovery ratios of the SLF (%)

Borrowing period	Discount rate			Default rate (for discount rate= 4%)		
	4%	6%	8%	10%	20%	30%
3 years (loans for upper secondary study)	24.9	19.6	15.6	33.3	29.2	24.9
4 years (loans for undergraduate study)	25.0	19.6	15.5	33.2	29.2	25.0
7 years (loans for upper secondary and undergraduate studies)	26.4	19.9	15.2	34.7	30.6	26.4

Appendix

1. Results of logistic regression

Variable	Coefficient	Standard Error	P-value
Household income	-0.00001**	0.000	0.010
Education attainment of head of household	-0.47789	0.379	0.207
Number of members who are the burden of household	0.25866	0.268	0.334
Sex	-0.17533	0.433	0.685
Age	0.22761	0.146	0.119
Type of school	0.47168	0.732	0.519
Type of education	1.48395**	0.449	0.001
Location	-0.07549	0.421	0.858
Constant	-7.62449**	3.002	0.011

Note: ** significant at the 95% confidence level

2. Methods of Matching

1. **One-to-one matching (1-nearest neighbor)**: the method that chooses **one** comparison unit **(**non-participant) which has the closest propensity score with each treated unit.
2. **One-to-five matching (5-nearest neighbors)**: the method that chooses **five** comparison units which have the closet propensity score with each treated observation.
3. **Radius matching**: Each treated unit is matched only with the comparison units whose propensity score falls in a predefined neighborhood of the propensity score of the treated unit.
4. **Kernel matching**: All treated are matched with a weighted average of all comparisons with weights that are inversely proportional to the distance between the propensity scores of the treated and comparisons.
5. **Mahalanobis matching**: This method does not use the propensity score for matching the comparison group. The similarity of a comparison to the treated is measured by a metric on variables.

Source: Lee (2005)

3. Balancing property results for each matching method

Table A1: All sample

Variable	One-to-one		5-nearest neighbors		Radius, Kernel		Mahalanobis		No matching	
	Treatment group	Comparison group	Treatment group	Comparison group	Treatment group	Comparison group	Treatment group	Comparison group	Treatment group	Non - borrower
Household income (Baht/year)	61,598	51,300	65,607	73,920	61,598	123,164	62,966	72,700	61,598	122,342
Education attainment of head of household*	2.2	1.6	2.3	2.4	2.2	3.4	2.2	2.4	2.2	3.4
Age	18.1	19.5	18.1	18.0	18.1	17.7	18.1	17.9	18.1	17.8
Sex (Male)	34.8%	40.0%	35.7%	38.9%	34.8%	46.8%	36.4%	35.6%	34.8%	46.9%
Location (Municipal area)	52.2%	60.0%	52.4%	51.4%	52.2%	62.3%	52.3%	51.1%	52.2%	62.0%
Type of school (Public)	91.3%	90.0%	90.5%	89.7%	91.3%	91.1%	90.9%	91.1%	91.3%	91.2%
Type of education (Vocational)	50.0%	100.0%	45.2%	41.1%	50.0%	21.1%	47.7%	48.9%	50.0%	21.8%
Members who are the burden of household(persons)	2.3	2.9	2.3	2.1	2.3	2.0	2.3	2.3	2.3	2.0

Note: *Education attainment of head of household is ranging from "0 = no education" to "9 = doctoral degree"

Table A2: Sample with household income does not exceed 30,000 baht/year

Variable	One-to-one		5-nearest neighbors		Radius, Kernel		Mahalanobis		No matching	
	Treatment group	Comparison group	Treatment group	Comparison group	Treatment group	Comparison group	Treatment group	Comparison group	Treatment group	Non – borrower group
Household income (Baht/year)	19,500	17,250	19,500	20,770	19,500	19,044	19,636	20,250	18,965	20,684
Education attainment of head of household*	2.2	2.0	2.2	2.1	2.2	2.0	2.0	2.1	1.7	2.1
Age	18.0	20.0	18.0	17.8	18.0	18.1	18.0	17.9	18.1	17.8
Sex (Male)	40.0%	50.0%	40.0%	43.7%	40.0%	32.6%	36.37%	33.4%	28.6%	43.05%
Location (Municipal area)	50.0%	100.0%	50.0%	37.21%	50.0%	50.0%	45.46%	50.0%	57.14%	36.77%
Type of school (Public)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100%	96.4%
Type of education (Vocational)	50.0%	100.0%	50.0%	17.21%	50.0%	41.3%	54.55%	50.0%	64.29%	17.49%
Members who are the burden of household(persons)	2.1	2.0	2.1	1.9	2.1	2.0	2.1	1.9	2.3	2.0

Note: *Education attainment of head of household is ranging from "0 = no education" to "9=doctoral degree"

Table A3: Sample with household income is in the range of 30,001 - 60,000 baht/year

Variable	One-to-one		5-nearest neighbors		Radius, Kernel		Mahalanobis		No matching	
	Treatment group	Comparison group	Treatment group	Comparison group	Treatment group	Comparison group	Treatment group	Comparison group	Treatment group	Non–borrower group
Household income (Baht/year)	45,079	41,400	45,079	42,682	45,079	44,720	45,250	44,167	45,079	44,680
Education attainment of head of household*	1.7	0	1.7	1.7	1.7	2.3	1.7	1.8	1.7	2.3
Age	17.9	18.2	17.9	18.1	17.9	18	17.9	18.1	17.9	17.9
Sex (Male)	47.37%	40.0%	47.37%	48.05%	47.37%	44.0%	50.0%	50.0%	47.37%	43.9%
Location (Municipal area)	36.84%	20.0%	36.84%	38.96%	36.84%	49.17%	33.34%	33.34%	36.84%	49.06%
Type of school (Public)	94.74%	100.0%	94.74%	94.81%	94.74%	91.02%	94.5%	94.5%	94.74%	91.08%
Type of education (Vocational)	42.11%	0%	42.11%	40.26%	42.11%	18.68%	38.9%	38.9%	42.11%	19.25%
Members who are the burden of household(persons)	2.1	2.0	2.1	2.0	2.1	1.9	2.0	2.1	2.1	1.9

Note: *Education attainment of head of household is ranging from "0 = no education" to "9=doctoral degree"

Table A4: Sample with household income is more than 60,000 baht/year

Variable	One-to-one		5-nearest neighbors		Radius, Kernel		Mahalanobis		No matching	
	Treatment group	Comparison group	Treatment group	Comparison group	Treatment group	Comparison group	Treatment group	Comparison group	Treatment group	Non – borrower group
Household income (Baht/year)	130,773	95,455	130,773	133,966	130,773	163,353	129,964	146,786	129,964	162,818
Education attainment of head of household*	3.5	2.4	3.5	3.5	3.5	3.9	3.1	3.1	3.1	3.9
Age	18.0	20.0	17.5	17.5	17.5	15.9	18.1	17.6	18.1	17.8
Sex (Male)	27.3%	36.4%	27.3%	35.7%	27.3%	50.1%	28.6%	41.3%	28.6%	49.7%
Location (Municipal area)	63.6%	72.7%	63.6%	67.2%	63.6%	69.5%	64.3%	64.3%	64.3%	69.3%
Type of school (Public)	91.0%	73.0%	90.9%	87.9%	90.9%	91.4%	78.6%	78.6%	78.6%	91.1%
Type of education (Vocational)	45.5%	45.5%	45.5%	42.8%	45.5%	10.0%	42.9%	13.9%	42.9%	10.2%
Members who are the burden of household(persons)	2.1	3.3	2.4	2.4	2.1	2.0	2.8	2.5	2.8	2.1

Note: *Education attainment of head of household is ranging from "0 = no education" to "9=doctoral degree"

Table A5: Sample with household income does not exceed 150,000 baht/year

Variable	One-to-one		5-nearest neighbors		Radius, Kernel		Mahalanobis		No matching	
	Treatment group	Comparison group	Treatment group	Comparison group	Treatment group	Comparison group	Treatment group	Comparison group	Treatment group	Non – borrower group
Household income (Baht/year)	50,229	33,750	51,932	55,436	51,423	70,504	49,573	52,427	48,453	70,100
Education attainment of head of household*	2.9	2.1	2.9	3.0	2.9	3.3	2.8	2.8	2.7	3.3
Age	18.0	18.3	18.0	17.9	18.0	17.8	18.0	17.9	18.0	17.8
Sex (Male)	40.00%	12.50%	40.54%	41.46%	38.46%	46.26%	39.02%	36.59%	37.21%	45.97%
Location (Municipal area)	42.86%	62.50%	45.95%	54.27%	48.72%	55.37%	46.34%	51.22%	48.84%	55.28%
Type of school (Public)	91.43%	100.00%	91.89%	94.51%	92.31%	92.23%	92.68%	92.68%	93.02%	92.23%
Type of education (Vocational)	40.00%	62.50%	40.54%	35.37%	43.59%	22.35%	46.34%	43.90%	48.84%	22.95%
Members who are the burden of household(persons)	2.2	3.4	2.1	2.2	2.2	2.0	2.2	2.0	2.2	2.0

Note: *Education attainment of head of household is ranging from "0 = no education" to "9=doctoral degree"