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STUDENT FINANCIAL AID IN MONGOLIA:

THE EFFECT ON BACHELOR'S DEGREE COMPLETION

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Higher Education and

Comparative and International Education

by

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ABSTRACT

This study investigates the relationship between background, college experience, and financial aid variables and baccalaureate degree completion for a cohort of students enrolled in six public colleges and universities in Mongolia. A specific aim of this study is to determine the extent to which the receipt of financial aid influenced degree attainment and if this influence varied by different types of financial aid, apart from, and in combination with, background and college experience variables. The status data as of Fall 2005 for the students enrolled in the fall 2000 served as the target population of the study. The sample consisted of 4,398 cases and an imputation resulted in a dataset of 4,821 cases. Analysis methods include descriptive statistics and two models of logistic regression for both sample and imputed data. The study finds that aid recipients are 11-14% more likely to complete their undergraduate degree than non-recipients, and this effect varies by types of aid. Need-based grants have the greatest impact, followed by loans. Merit-based grants had the smallest impact on degree completion. Other significant predictors are college GPA, field of study, institution, residence, and parents' occupation. The study suggests that: a) the impact of receiving financial aid may be enhanced in a low-income and transitional context and when linked to tuition level; b) need-based tuition grants are the most effective, and c) soft loans may be as effective as grants if linked to tuition and directed towards low-income students.

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Chapter 1

INTRODUCTION

Statement of the Problem

In the countries of the former Soviet bloc, higher education has been controlled and sponsored by the government for many decades. Only a limited number of high achieving high school graduates gained admission to post-secondary institutions, and they acquired higher qualifications and credentials at no direct financial cost to them or their parents. However, the transition to a market economy is changing the situation dramatically.

Transitional countries are experiencing tremendous expansion in higher education at a time of decreasing government sponsorship. Between 1990 and 1997, tertiary¹ enrollment rates as a percent of the 18-22 age group have increased from 14% to 24% for Hungary, 19% to 27% for Bulgaria, 16% to 25% for Latvia, 9% to 12% for Azerbaijan, and 11% to 15% for the Kyrgyzstan (Berryman, 2000). Mongolia witnessed a gross enrollment rate of 29.1% in 1999, almost three times the 1992 rate and over the level that distinguishes elite higher education from mass higher education (MECS, 2002; Trow, 1973). The development to a modern, academically free, university system that is open to an increasingly larger proportion of society, has often been observed as compatible with the spread of a democratic society (Parsons, 1973).

¹ Although the term “tertiary education,” instead of “postsecondary” or “higher education,” is in the International Standard Classification of Education (ISCED) (UNESCO, 1997) and education statistics of international organizations such as such UNESCO, World Bank, and OECD, from here, higher education is interchangeable with tertiary education, for the purpose of consistency.

This new system of higher education has come with its own costs. The combination of enrollment pressure, demand for a skilled workforce, along with serious fiscal constraints and the change in the perspective on higher education from a “social good” to a “private good” has led many Asian countries, in transition, to impose tuition and other fees for higher education. Hence, the tradition of the government provision for “free higher education” is not likely to continue, and acceptance is growing for a cost-sharing principle in the financing of postsecondary education (Berryman, 2000; Altbach, 2004). Cost-sharing is generally considered the introduction of, or a sharp increase in, tuition fees to cover part of the costs of instruction. Cost-sharing may also be regarded as user charges that cover more of the costs of lodging, food and other expenses of student living that may have hitherto been born substantially by government or institutions (Johnstone, 2003). Cost-sharing takes different forms in different countries. For example, Russia charges tuition to one student in five. Also for some Russian institutions, tuition and other non-governmental revenue reached 70% of their budgets in the late 1990s (Bain, 2001).

Currently, tuition and fees compose over more than one-fifth of the total operational budgets of Chinese higher education institutions (Min, 2004). While three categories of institutions (national, state, non-state) in Kazakhstan each receive funds differently through the government (fully, partially, and self-financing), in Kyrgyzstan 70-80% of students, who do not receive national scholarships of tuition grants and stipends, pay tuition and finance living costs (Johansson, 2004). In Mongolia, within less than a decade, tuition and fees charged to students replaced three quarters of government direct funding for higher education. Indeed, cost-sharing and gradual substitution of

government funding by private sources for higher education are an international trend in higher education finance; this is especially evident in transitional economies.

A major problem associated with tuition charges, user fees, and living expenses paid for from private sources as opposed to government funding is that not everyone can afford to bear all the costs of higher education. Children from poor families are the ones most likely to be excluded from higher education due to financial burdens, giving rise to educational stratification and inequality.

This problem is especially intense in transitional economies, where dramatic changes and the differentiation in people's lives and well-being along the lines of income, gender, geography, education, and occupational traits are occurring in a span of a generation which, otherwise, experienced relatively equal access to social services prior to transition. As studies document, poverty and gender inequalities in education are emerging in the transitional countries of Central Asia and Eastern Europe (Paci, 2002; Silova & Magno, 2004).

In Mongolia, gross national income per capita equals US\$400 and 36% of the population lives below the official poverty level (World Bank, 2003; United Nations Development Programme & National Statistical Office, 2000). Educational inequality, once determined, is likely to transfer into employment or status attainment. Inequality is likely to increase from generation to generation because lower levels of human capital in one generation can trigger less human capital and greater poverty in subsequent generations (Robinson & Garnier, 1985; Graetz, 1988; Post, 2003; Berryman, 2000).

One way to address the problem of educational inequality is for governments to provide financial aid to needy students. Over a decade ago, Mongolia initiated a student

financial aid system to assist economically disadvantaged students to attend higher education institutions. As established in the Mongolian Constitution, the intent of this policy was to ensure the equal right to education for everyone. Financial aid, in the form of both grants and loans, was awarded to eligible students on the basis of belonging to a particular occupational or family status group. Other countries of Central Asia are also adopting or are likely to adopt similar policies of financial aid to cope with emerging problems of educational inequalities.

However, the impact of investment in financial aid rather than in the institutions of higher learning in transitional countries has not had adequate study. Improving the efficiency and viability of student financial programs, while broadening their coverage, is a major challenge for developing countries (Johnstone, 1998). A number of significant questions arise: Does financial aid ensure citizen's equal rights to education? Does financial aid policy in transitional economies impact college degree attainment in a similar way as in established market economies? How adequate is the amount of financial aid to the needs of students and costs of higher education? As Lewis and Dundar (2002) note, most developing countries face a number of unresolved, unexamined, yet crucial questions, concerning issues of equity in access, choice, persistence, and completion in higher education.

In view of these questions, a larger policy issue in which national policymakers, provincial education authorities, and institutional leaders have interest is: How effective are student assistance schemes in overcoming emerging inequality in higher education in the context of developing countries that have adopted market-based financing? Hence, research testing the efficacy of remedies for educational inequality is needed. Examining

the effectiveness of student financial aid in Mongolia, as one of the countries that recently and rapidly adopted market-based financing of higher education, may contribute to the understanding of different instruments intended to decrease inequality.

Research Questions

Using Mongolia as a case study, this thesis examines the relationship between student financial aid and degree attainment. Specifically, the study seeks to answer the following research questions:

1. Controlling for student background and academic factors, and institutional influences, is the receipt of financial aid related to bachelor's degree completion?
2. Are different forms of financial aid related differently to degree completion?

In order to answer these questions, the study makes use of theoretical perspectives, methodologies, and empirical research developed in the USA and pertinent to student financial aid. In Mongolia, the transition to a market economy and striking changes in the financing policies resulted in the establishment of a demand-driven higher education market, to which economic perspectives and concepts are applicable. However, this market is vulnerable due to salient contextual factors, pertinent to the country, for which a lack of research-based policy interventions exists.

As numerous researchers in the United States have demonstrated, financial aid along with other factors such as gender, academic preparation, discipline, college experience, and so on, can influence one's degree attainment. Financial aid recipients are expected to complete their studies at least at an equal, if not higher rate when compared to their non-recipient peers.

The research has also documented that different forms of financial aid have varying effects on students from different racial and income groups. Grant aid is more effective than loans in helping needy students with completion of their college studies. Therefore, in Mongolia, expectedly, grant recipients are more likely to achieve degree attainment than are loan recipients.

Significance of the Study

Since the inception of the financial aid system in Mongolia in 1993, no empirical study has assessed its impact on college attendance and graduation. Over the past decade, the government of Mongolia spent billions of togrog² from its already limited budget for assisting students enrolled in tertiary education, both abroad and domestically. However, whether this assistance is achieving its intended outcome, the goal of ensuring the equal rights of citizens for education, is largely unknown.

This study has significance for multiple levels of practitioners. First, it may help guide Mongolian policy makers' decisions about higher education financial aid system by

² National currency of Mongolia. US\$1=1,185 togrog as of 2004 (National Statistical Office [NSO], 2005a).

providing a means to assess the system through the establishment of baseline measures that guide policy recommendations. Second, by providing evidence of varying influences that affect degree completion, this study will draw university faculty and administrators' attention to the problems of retention and graduation of financially and otherwise disadvantaged students. Third, focusing on a transitional country, this study informs policymakers of higher education finance in similar contexts.

Scarcity of research about educational inequalities exists in the contexts of poor and transitional countries (Buchmann & Hannum, 2001). This scarcity refers to both problems of educational stratification and its remedy – financial aid policies. This study contributes to filling this research gap and advances understanding of complex problems associated with the provision of equal educational opportunities in transitional context.

This study builds upon and complements a large body of previous research about the United States in that it examines financial aid together with rural/urban and spatial dimensions of inequality, in addition to college experience and background variables. Most of the previous studies focus on enrollment and persistence effects of financial aid. Relatively few studies have examined the effect of financial aid on degree attainment. In doing so, researchers often considered student's college experience and background characteristics as alternative influences neglecting some contextual or environmental factors that may influence degree completion. Also, conducting this study in a low-income and unsubsidized tuition-driven context may bring insights regarding the applicability of human capital investment theory in such contexts.

Limitations

A major problem associated with conducting research in developing and transitional contexts is the absence of reliable, longitudinal data. In Mongolia, although data collection on students occurs, integration of the information has not. Thus, a multifactor analysis is often impossible. No systematic survey is conducted. The approach taken in this study utilizes existing data and creates status data by combining the recent and past reports of students' admissions, financial aid, progress, and graduation information. However, this strategy poses several limitations to the study.

The selection of the variables for the study is greatly limited due to data availability. Variables such as parents' education, degree aspirations, and some collegiate experiences that researchers have previously tested are absent in this study, simply because no information currently exists for these variables.

Although family consumption level, relative to the minimum living standards, is a proxy for family income, application is absent for direct measure of socioeconomic status or family income, both important variables determining the success of students as proven by research. The presence of a large informal sector and nomadic livestock herding in Mongolia, which supplement family consumption by a quarter in urban areas and up to 60% in rural communities, creates a difficulty in relying on income statistics that reflect only cash receipts within a family (see NSO, 2005b).

The findings of this study have their basis in a single cohort of students who entered six major public institutions in the Fall of 2000. Since these institutions hardly represent all higher education institutions in Mongolia, generalization of the findings to the entire population of students is another issue of concern. However, the findings that

draw upon the entire population of particular institutions may be more valuable to similar institutions in similar contexts than the findings of national studies, which sometimes are hardly applicable to another country.

Chapter 2

BACKGROUND CONTEXT AND FINANCING HIGHER EDUCATION IN MONGOLIA

This section describes the background developments in the political, economic, and higher education contexts that are pertinent to student financial aid problems in Mongolia. The intention here is to highlight how financing policy for higher education has changed over the past decade given the specific context of the country and recent developments in higher education. Evolution and recent trends in student financial aid programs, also described, provide background information for the proposed study.

Political and Economic Contexts

Mongolia is a small, basically agricultural, poor country, which occupies a large area of 1.656 million square kilometers, located in Central Asia, between Russia and China. This landlocked, sparsely populated territory is more than two times the size of Texas or slightly smaller than Alaska. The population reached 2.5 million in 2004 of which 64% are under the age of 30; 43% are rural, nomadic populations. Over a quarter of inhabitants live in Ulaanbaatar, the capital city, located at the heart of the country (NSO, 2005b; NSO, 2001). In 2003, per capita gross domestic product (GDP) was around \$400, to which trade and services, agriculture, and industry contributed 58%, 20% and 22%, respectively (World Bank, 2003; Asian Development Bank [ADB], 2004).

With the collapse of the former Soviet Union and so called Soviet Bloc, Mongolia started its transition to a democratic and free market society in 1990. Among the transitional countries, Mongolia was regarded as one of the few that simultaneously and peacefully conducted necessary reforms in political, economic, and social sectors.

The new Constitution of 1992 established a new democratic governance structure. Openness and democracy became permanent societal values. Although the President is the highest ranking person in the country, the President has only limited power over a few matters, such as appointment of judges, representation of the country internationally, and chief commander of armed forces (Constitution of Mongolia, 1992). In contrast, the common perception is that the unicameral parliament and its 76 members enjoy a relatively high level of political power, not only over legislative matters, but also over governance and policy issues. This political power relates to parliament's right to appoint the prime-minister, members of the Cabinet, and the heads of major government agencies. By law, only the President, the Prime Minister's Cabinet, and the parliament members have right to initiate new laws or policies, which usually must be approved by the parliament.

Over 20 political parties exist. However, the Mongolian People's Revolutionary Party (MPRP), the former communist party, and the newly established Democratic Party (DP), the merger of several parties including the National Democratic and Social-Democratic parties, enjoy national level support and have enough power to influence the national policy environment. Although the MPRP formed a single party government in 1992-1996 with a strong democratic opposition in the Parliament, a DP government

replaced it in 1996 as a result of parliamentary elections in which the DP gained a majority.

Ambitious reform initiatives, frequent changes in the government, and a perceived increase in corruption during the DP rule swayed public support to the MPRP, which won the 2000 parliamentary election with an overwhelming majority. However, the MPRP government faced criticism for being less democratic, opaque, more intrusive, and slow in adopting market-oriented reforms and also for increased corruption. Consequently, in the 2004 election, no party won a majority in the Parliament and hence a coalition government formed (including members who represent the different political parties).

In relation to higher education finance these political developments had their own impact. The Constitution of 1992 declared citizen's equal rights for education. Research tracing how this idea of the right to education became part of the constitution is absent. Nevertheless, what is known widely is that the committee for the development of the draft constitution had studied the constitutions of many countries. More likely, the idea was borrowed from somewhere, but was clearly very close to the heart of the multiparty representatives to the Great Hural, which, for over five months of its session, discussed and adopted each paragraph and article of the constitution.

In the 1992-1996 period, Mongolia developed many education reform proposals, including comprehensive education sector review, resulting in the development of the master plan for the reform of the education sector in 1994-1998 (ADB, 1993; ADB, 1994). The Master Plan set an objective of reforming higher education to serve national development needs more effectively (ADB, 1994). Part of the actions to achieve this objective included a proposal to abolish the old manpower planning approach that

directed the finance of higher education. An alternative suggestion was to establish a direct student loan program to allow students to “use at the institution and in the field of their choice” (Ibid, p. 51). This period clearly showed, the socialist planning system had been left behind, but the shape of new a demand-driven system had not been formed. However, the Master Plan, developed with a heavy input from international consultants hired by the Asian Development Bank, made many things clear for the government and educators.

The education agenda of the DP for the 1996 election promised to intensify the market-oriented reforms. Sponsoring needy students, sending Mongolians for overseas training, providing more autonomy to the institutions, and privatizing were among the educational priorities of the Democratic Party. The government reform efforts have had backing from assistance from international donor organizations. The Asian Development Bank sponsored a series of large scale technical assistance and loan projects covering all sectors of education. The higher education component of the education sector development program established a quality assurance system, in-country and overseas short-term training of faculty, the publication and purchase of textbooks, and curriculum development (ADB, 1996).

However, by 1997 the government funding for higher education was only 10% of public institution’s operating budget (Weidman & Yeager, 1999). Because higher education became highly dependent on tuition revenue, student demand rather than specific numerical or quality enrollment targets has increasingly determined admission (Weidman, et. al., 1998). Coinciding with these outcomes, the government greatly encouraged the development of private higher education and a former public business

school became private and completely dependent on tuition and other non-governmental revenues (Bat-Erdene, Sukhbaatar, & Yeager, 2002).

The parliamentary election of 2000 brought new changes in the financing of higher education. Consistent with MPRP's traditional commitment to social protection and justice, the action program of the new government, established in 2000, declared that the government would take measures to provide free higher education to the children of the poor, herdsmen, and large families (Government of Mongolia, 2000). Appropriate regulations have been developed and enacted to include children of the poor, herdsmen, and large families³ (with three or more children attending college) into student financial aid programs. These commitments required additional resources. Accordingly, in 2000-04, the share of higher education in government education expenditures rose by 3-4% over the stable 14% level for the previous period. In addition, the reforms efforts have become more systematic and planned, as the Government adopted an education development strategy for 2000-04 and greater coordination among donor efforts has been emphasized (Government of Mongolia, 1999; Weidman, 2001).

In the parliamentary election of 2004, education was, again, a key issue of pre-election political debate of the major parties and coalitions. Democratic Alliance promised a monthly allowance of 10,000 togrog for every child under 18. The MPRP countered with 500,000 togrog assistance to a newly married couple. Because of the potential for diverting resources from financing education and useful as lessons learned

³ According to official statistical data, in 2004, 36 percent of population lived below minimum living standards, rural population, largely consisting of herdsmen families, accounted for 41 percent of the total, and the average household size was 4.2 (National Statistical Office, 2005b).

for the policymakers in similar contexts, the debate around “children’s money” is worth discussing in more detail.

Although no specific and reasonable rationale was declared to support the “children’s money” or “trust money” initiative, these were, supposedly, poverty reduction measures and were for the “betterment of children.” As soon as the new Parliament of 2004 elections commenced its regular session, this initiative quickly became a major source of controversy among rival political forces. The debate, whether the government should or should not launch the program was especially heated when one of authors of the initiative, Mr. Gundalai (who became a parliament member largely thanks to the program) threatened to resign if full implementation was ignored. However, his opponents, mostly parliament members representing the MPRP, argued that the program was not realistic and the government did not have enough resources to implement it.

Indeed, as some estimates suggest, full implementation would require about 120 billion togrog (approximately the same amount as the total national education budget) or 14% percent of the national budget (Odpurev, 2006). In the end, no one resigned from the Parliament and a consensus provided 3,000 togrog, monthly, to every child under 18 of the families with incomes less than the guaranteed minimum living standard. This occurred despite many members of the government, including Prime Minister Elbegdorj, being from the Democratic Alliance.

The “children’s money” program debate gained strength at the beginning of 2006 when the Elbegdorj government resigned as a consequence of the dissolving of the Democratic Alliance in Parliament. Prime Minister Enkhbold (this time a representative of MPRP) was appointed to chair the cabinet of the National Solidarity Government. This

time, Mr. Gundalai (who became the Minister for Health in the new cabinet) and Mr. Elbegdorj (who became a chair of the Democratic Party after resigning) led a campaign for “Trust Money” arguing that the government had enough resources for every child under 18 be given 10,000 togrog, monthly.

Finally, the decision was made to expand the program to include every child under 18 (which constitutes over one million of the 2.5 million populations) regardless of family income. And, at the same time, programs initiated by the PMRP gained approval such that one time allowance of 100,000 togrog for a new born child, 500,000 togrog for newly married couples, annual assistance to mothers with many children amounting to 50,000-100,000 togrog, and quarterly allowance of 50,000 togrog for the veterans of the revolutionary movement, labor heroes, and the holders of national titles in different professional fields (Enkhbold, 2006).

The debate was not only within the political sphere. Researchers and economists widely discussed both positive and negative consequences of these initiatives. Even though a known economist, former Prime Minister Byambasuren, advocated that the allowance would expand consumption and consequently would boost the economy, realistic thinkers with a knowledge of market economy feared that an immediate effect of cash allowance would be diversion of resources from necessary investments, promotion of imports, which make up a dominant portion of consumption, and contribution to inflation that, in aggregate, would adversely effect domestic production.

Therefore, as Odpurev (2006) suggested, the program could stimulate economic development if it offered domestically produced consumer products, instead of cash. An implication of the program would be, not only a limitation of the government potential to

invest in education, particularly in student financial aid, but also an increase in inequality in the guise of equity. While 10,000 togrog (approximately, less than \$10) is nothing for the rich, supposedly the same amount given to the poor for a specific purpose may make a difference. Yet, without such a purpose or condition, believing that the money will eventually reach the children and be useful to them is difficult. The debate continues to this day. Recent media news from Mongolia reports that the leaders of the DP continue to argue for the increase for children's money, up to 5,000 togrog per month. This example clearly shows how advocates of a market economy and radical reforms such as the leaders of the Democratic Party may create something that is indeed based on a socialist principle of equal distribution of social wealth and services. Perhaps, Steiner-Khamsi's (2005) contention that the socialist past may serve as a frame of reference for adults in transitional countries, is also relevant to those policymakers who claim themselves to be champions of liberation, democratization, and market-oriented reforms.

As one can observe from the previous discussion, although continuity exists in the government policies for higher education in Mongolia, the major changes in financing of higher education have been greatly influenced by the education agenda of the ruling political party. The reality is that the populist election agendas of political parties often drive policy changes rather than serious policy research. If a political party or alliance wins an election, its education agenda becomes a government action program and then, appropriate policy regulations develop to enact and address the political agenda. Although the two major parties gave a high priority to education, one might observe a difference that over the past decade the Democratic Party favored more radical, market-oriented reforms, while the MPRP emphasized social protection and a sluggish transition

to an education market. Student financial aid was perhaps one of few proposals that served both approaches: market-based reform and social protection of the poor. This initiative thus gained support from both political parties.

Apart from politics, in a small country like Mongolia, the economic situation of the country can also exert, to a great extent, influence on the financing policies for education. Economic condition is relevant to higher education, not only because it impacts the government's capability for financing, but also due to its impact on employment prospects for graduates.

Currently, the private sector produces over 60% of gross domestic product, as the economy slowly recovers from a deep crisis of the early 1990s. However, its growth is very sensitive to external influences such as weather conditions and world prices for raw materials. For example, between 2000 and 2003, the loss of several million head of livestock due to harsh winter conditions caused overall reductions in agricultural output. Similarly, the changes in the world price of gold, copper, and cashmere, which are the main export items of Mongolia, impact the growth of the industrial sector. The government budget in Mongolia takes an increasingly larger portion of GDP, runs a substantial deficit of 4.1%, and, has an external debt equaling 86% of gross national income (Table 2-1).

Although inflation and unemployment rates are decreasing, earning potentials and employment opportunities have limitations due to the overall low wage level and slow economic growth. As of 2001, the average wage of public employees was below \$100 per month and 46.7% of registered unemployed people possessed at least vocational education (NSO, 2001). However, the fast growing service sector and informal economy,

which is estimated at 30% of formal economic activities, are likely to provide increasing employment opportunities to university graduates. Nearly 46% of people employed in the informal sector of the economy had some form of postsecondary education, either vocational training, college, or university (Bikales, Khurelbaatar, & Schelzig, 2000).

Table 2-1: Selected Mongolian Economic Indicators, 1994-2003

		1994	1996	1998	2000	2001	2002
GDP	Growth rate	2.3	2.4	3.5	1.1	1.0	4.0
Agriculture	Growth rate	2.7	4.7	6.4	-14.9	-18.5	-10.5
Industry	Growth rate	2.1	0	3.8	1.6	16.2	5.0
Service	Growth rate	2.0	3.3	0.3	18.6	8.2	12.1
Government Expenditure	As % of GDP	n/a	n/a	31.4	34.4	36.7	36.7
Budget Surplus/deficit	%	n/a	n/a	-12.5	-6.8	-4.1	-4.1
Inflation	% change	66.3	44.6	6.0	8.1	8.0	1.5
GDP deflator	%	n/a	n/a	-5.2	8.9	8.3	6.2
Exchange rate	Tog=US\$	n/a	n/a	841	1077	1098	1110
Unemployment	%	9.1	7.7	5.9	4.6	4.6	3.4
External debt	% of GNI	n/a	67.9	74.7	93.9	85.9	n/a

Source: ADB, 2004; Goyal, 1999; NSO, 2001.

In short, a slow growing and vulnerable economy, with an enormous external debt and a huge public sector, limits government potential for direct financing higher education. In addition, such an economy provides little employment opportunity for the graduates with university degrees.

Higher Education

The education system of the country consists of preschool, ten years of primary and secondary schooling (of which eight years is compulsory), one to three-years of secondary vocational-technical education, and higher education (which provides, typically, a four-year bachelor's, two-year master's and three-year doctoral degree programs). Primary and secondary education is currently in transition to 12 years of schooling. Some colleges and universities also offer a diploma (up to three years of study) and certificate courses mainly in vocational and technical fields. Primary and secondary education is provided free of charge. Schools employ very similar types of facilities, mostly built during socialist times. In recent years, not only local governments, but also MECS (with assistance from Japan and ADB) have made sizable efforts to improve school facilities. The provision for textbooks and instructional materials is not very different across the country, because schools receive similar levels of funding from local budgets based on standards for fixed costs and per student variable costs. Even the few private schools that appeared lately are eligible to receive funding from the local government equal to per student variable costs.

Schools use curricula and standards developed and recommended by MECS. Unlike the past, local education authorities now are free to make changes in the curriculum, not to exceed 25% of its total teaching hours. Consequently, one might expect to find a comparable level quality of primary and secondary education across the country. However, four mitigating factors prevent this from happening. First, rural schools experience a lack of qualified teachers and bear high utility costs for heating and electricity, and moreover, receive less funding because they enroll fewer students.

Second, schools in Ulaanbaatar and other cities are overcrowded due to population migration from rural to urban areas. City schools often run two and three shifts with average class sizes of over 40. Third, textbooks, specialized courses, and out-of-class advising and consultation with teachers are fee-based. Those who are not able to afford these services face significant disadvantages. Finally, the largest loss in the participation rate comes after the compulsory basic education of eight years. A likely contributor to this loss is the secondary school restructuring and consolidation initiative which led to the reduction of schools that offer upper-secondary education especially in rural counties (MECS, 2005a).

The first university in the country – the National University of Mongolia- was established in 1942. Prior to 1990, only six institutions offered degree programs. Since the adoption of the new Constitution in 1992, private institutions were allowed to operate and many former “technikums,” which prepared basically technical, middle level specialists, have since upgraded to colleges. The government also initiated privatization of public institutions. In accordance with this initiative, a management team of private individuals with appropriate experience, selected on a competitive basis, operate a public institution similarly to a private one (with a modicum of governmental control). Private colleges offer degree programs mainly in the fields of business, management, law, languages, trade, and services.

According to the 1995 Higher Education Law, the institutions of higher learning divide into two categories: university and college. A major difference between these two categories is that universities offer a full range of degrees, while permitting colleges to

offer programs up to master's degree (Higher Education Law, 1995). Table 2-2 provides information on the number of public and private colleges and universities.

Table 2-2: Number of Universities and Colleges by Type, 1993/94-2000/01

		93/94	94/95	95/96	96/97	97/98	98/99	99/00	00/01
University	Public	6	6	6	6	6	6	8	8
	Private	-	-	-	-	-	-	1	3
Colleges	Public	26	26	23	23	23	27	28	30
	Private	25	36	37	46	57	71	81	131
Total	University	6	6	6	6	6	6	9	11
	Colleges	51	62	60	69	80	98	109	161

Source: MECS, 2002

Governance and Management

Consistent with the strategy of decentralization, higher education institutions have adopted more democratic governing structures. Major principles of self-governance, self-finance, academic freedom, and institutional autonomy, now have the protection of legislation. Governing or management boards of colleges and universities include representatives from the government, employers, faculty, and students. According to the Higher Education Law of 1995, a simple majority of the board are appointments of the founder (state or individual) while other members are elected (Higher Education Law, 1995). For example, elected board members at a particular institution represent faculty and student communities. Except for the National University and National Technical University (for whose rectors have endorsement from the prime-minister), the board appoints the rector, approves academic and financing policies, and confers academic

degrees and credentials. However, given little experience with democratic governance, board power is weak and the rectors have practically unconstrained administrative power over academic and other matters. This situation is especially evident in case of private institutions because for many of them, the founder-individual often serves as the rector. Although institutions are largely self-financed, government adoption of performance/output-based financing, in 2002, further strengthened the rector's power (Sukhbaatar, Bat-Erdene, & Yeager, 2004).

Curriculum and Content

Except for medical and some engineering fields, a typical bachelor's degree requires four years of study in a program with no less than 120 credits. Each undergraduate degree program consists of general education (liberal arts), basic professional education (foundations of the field), and specialized education (major) components, that must be in ratios 3:4:3, respectively as the Ministry recommends (MSE, 1995; Bat-Erdene, 2004). In order to offer a new program, institutions are still required to obtain special permission for a specified period (usually 4- 5 years) from the Ministry of Education. In the absence of program accreditation, such special permissions serve as a way of ensuring that the institution has enough resources (faculty, classrooms, texts, and so on) to implement that program. Since the program is a major defining element of the course of the study, a group of students enrolled in a specific program remain the same throughout the course of study and most academic and social activities take place within that group.

Under the socialist system, curriculum content oriented considerably toward providing theoretical rather than practical knowledge and foundations. During the transition, attempts have focused on making curriculum and course content more relevant to the field of future employment, especially in business and economics majors (see for example, ADB & MOSTEC, 1999; Hall & Thomas, 1999). Since 2000, most business and economics programs have accepted a common core curriculum to establish minimum quality standards and provide easy transfer of students from one institution to another (ADB & MOSTEC, 1999).

Admission

Decentralization covers many areas including admission to universities and colleges. Centralized state entrance exam systems were abandoned in the middle of the 1990s, although a national exit exam for general secondary education was introduced in 1997. The universities and colleges began to compete with each other for students, and also cooperate, for example, in organizing entrance exams throughout the country. In Mongolia, higher education institutions largely concentrate in the capital city, Ulaanbaatar, although students come from every remote area where a high school exists. Therefore, entrants from rural areas undergo examination locally, by joint commissions formed by several different institutions. In case of elite institutions, admission is quite competitive. As a result, the Consortium of Mongolian Universities and Colleges, which only includes prestigious public and some private universities, implements the entrance exams in provincial centers. Conversely, access to small private colleges is almost open.

For these institutions, a general education diploma and a less complete entrance exam score provide enough bases for the enrollment decision.

Quality and Accreditation

Although private institutions play increasingly important roles in providing access to higher education, many of them are quite small (only few hundred students) and are regarded as being low-quality institutions. Obtaining a license to run a private college from the Ministry of Education, Culture, and Science⁴ requires meeting several conditions in terms of facility, faculty, library, and financial resources. However, for many people with sufficient wealth, and some business entities, the establishment of a private school is an attractive investment, because, by law, educational institutions are exempt from value-added and profit taxes that are major revenue sources for state budget. This situation led to a mushrooming in the numbers of private colleges in Mongolia (Lin-Liu, 2005a).

To ensure at least minimum quality, a semi-governmental body, the National Accreditation Council for Higher Education (NACHE), was established in 1998. Although a majority of the Council members consists of the rectors of leading universities, the Minister for Education, Culture, and Science and relevant officials from the MECS are the ones who determine the policies of the Council. While all higher

⁴ Over the past 15 years, the name of the ministry responsible for education has changed several times, although the functions mostly remained the same. Since 1992 to 1996 - Ministry of Science and Education (MSE), between 1996-2000 – Ministry of Science, Technology, Education, and Culture (MOSTEC), and since 2000 - Ministry of Education, Culture, and Science (MECS). Current name is in use in the text, but citations reflect respective names.

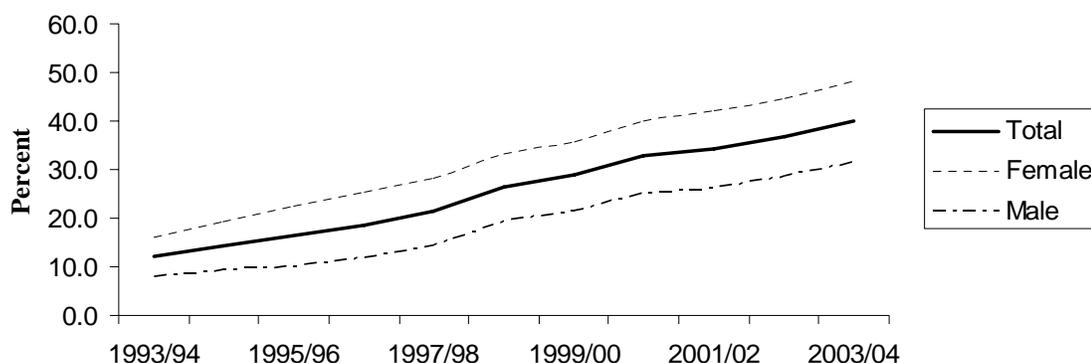
education institutions must undergo accreditation, many private colleges are reluctant to apply for accreditation in a fear that they may not pass the accreditation criteria. Major criteria for accreditation focus on whether an institution has a clear and publicly stated mission, has made progress towards achieving the mission and purposes, has established the extent to which resources of the institution are directed and organized toward achieving educational objectives, and has demonstrated the integrity and commitment to mission accomplishment (NACHE, 2005a).

As of 2003, the majority of public institutions have been accredited for a five year period, whereas, only 15% of over 140 private colleges have successfully secured accreditation (NACHE, 2005b). Given this slow pace of accreditation, perceived inadequate quality of instruction, and insufficient maintenance of pre-specified conditions, the Ministry of Education, Culture, and Science refused to renew the licenses of several private colleges at the beginning of 2005.

However, not all private institutions are weak. Colleges and universities such as Otgontenger, Mongol Business, Ikh Zasag, Mandakh Burtgel and Ulaanbaatar College are very competitive with the public institutions and have already been accredited. They charge higher tuition and enroll the best students in their program areas. The institutional accreditation has an important implication for students. In order to receive a financial aid, even a loan, students must enroll in an accredited institution. Therefore, before 1998, students attending private institutions were excluded from government financial aid.

Probably the most striking development in higher education over the past decade is its tremendous expansion. As Table 2.3 shows, over the period, total enrollment increased 3.5 times with enrollment in private colleges increasing eight times as opposed

to a little over three times for public institutions. As of 2003, public institutions represented 68% of total enrollment, down from 85% in 1993. Such impressive growth is partially due to population growth, which over the period, basically stayed stable, at less than 1.5% (NSO, 2005b). The fact is that an increasing proportion of 18-22 year olds are going to college (see Figure 2-1). One might wonder at the reason for Mongolia's increased demand for higher education despite increasing costs and the slow economic growth. The answer is not simple and it depends on the different points of view through which the growth is considered.



Source: Author's calculation based on: MECS, 2002; MECS, 2004a; NSO, 2001, and NSO, 2005a.

Figure 2-1: Gross enrollment rate in higher education, 1993-2003.

Economists would argue that demand relates to future employment opportunities and wage premiums for people with higher education. Although no long term labor market projections are available, the likelihood is that further stable economic growth will produce, in the future, more demand for skilled labor, if Mongolia is able to maintain

a GDP growth rate of 10%, similar to that reached in 2004. A recent survey conducted by the Employment Agency of the Ministry of Labor and Social Protection of Mongolia partially supports the contention that more future employment opportunities exist for college graduates (Employment Agency, 2004). In 2004, 49 to 62% of a total of 2112 companies⁵ in four sectors (trading, hotel and restaurant, manufacturing, and electricity and thermo-industry) indicated that demand for their production and services will increase over the next 12 to 18 months, while 24 to 34% expected no change. Trading and manufacturing companies expect the highest increase in demand. However, over half of surveyed companies intend to meet growth demand by investing in equipment and buildings rather than by increasing the number of employees. Perhaps, the increased investment in hardware will, in turn, require hiring more skilled labor to operate the equipment and facilities. Economic prospects and projections can help clarify whether or not employment opportunities will expand or shrink in the future; therefore they provide little insight into postsecondary enrollment growth that occurred at the time of slow economic development.

Sociologists, taking the status attainment perspective, suggested that demand for education is due to increasing social mobility. For example, Sorokin (1954) stated that upward social mobility to reach a higher social position is evident in any society. In democratic societies, the opportunities for vertical social mobility are even greater, because all positions are, at least theoretically, “open to everybody who can get them,” and the social organizations such as army, church, school, and so on, serve as the

⁵ National Taxation Office maintains records for approximately 40,000 officially registered companies in Mongolia.

channels for vertical circulation (Sorokin, 1954, pp. 138-177). Perhaps, Mongolia's transition to democracy and market economy, together with relaxed admission to postsecondary education, which traditionally was highly valued, facilitated greater enrollment of those who would not dream of a college education in the past.

The third view point, that may explain the growth, relates to the consumption function of higher education. The main hypothesis of this view is that unemployed people are more likely to turn to postsecondary education than otherwise (Berggren, 2006). However, in Mongolia, observed enrollment growth was not only during economic recession before 1994, but also, to a greater extent, in a period of relative economic recovery and growth afterwards. Perhaps, many different factors contributed to this phenomenal growth making explanation from a single perspective problematic.

Two major strategies facilitated such an impressive expansion. The government adopted decentralization of finance and decision-making and privatization to guide reforms in higher education (Bat-Erdene, Sukhbaatar, & Yeager, 2003). Decentralization appears from diversifying sources of financing, de-centralized admission, and delegation of many areas of decision-making to the institutions. Privatization took the form of all four models identified by Bray (1998; 2002): transfer of ownership, shifting sectoral balance, government support of private schools, and increased private financing and control of public institutions. As some researchers (Weidman, et. al., 1998) concluded, demand for higher education rather than government policies supposed to improve supply drove this expansion.

However, the major impetus for the postsecondary enrollment increase is debatable since no study has investigated this issue. As Table 2-2 (see p. 22) shows, the

number of private colleges more than tripled between 1993 and 2000. As of 2000, five times as many private colleges as public institutions existed. Perhaps, the increase in the number of private colleges with their flexible and almost open admission procedures has provided the bulk of the enrollment increase by providing places for those students who would not have qualified in the past. Private higher education was mainly responsible for the increase in supply of college openings, which induced an adequate response from the increasing demand for higher education. However, the postsecondary education enrollment increase also occurred within public higher education. Because no substantial expansion of public higher education facilities accompanied the growth, the public enrollment increase indicates a growth in the social demand for higher education. Noteworthy is that public higher education admission procedures are still very competitive and remain so, although relaxed at some schools between 1993 and 2000.

Table 2-3 shows total enrollment in higher education over a decade. In 2003, total enrollment increased by 80 thousand students compared to 1993. Approximately three fifths of this increase occurred in public higher education, while private colleges enrolled the remaining two fifths. This data provide a basis for speculating that the supply of private college placements partially drove the postsecondary enrollment increase in Mongolia. But mainly increased social demand, accommodated mostly in public higher education, is responsible for the growth. However, future growth is likely to occur mostly in private institutions, due to their potential for expanded capacity.

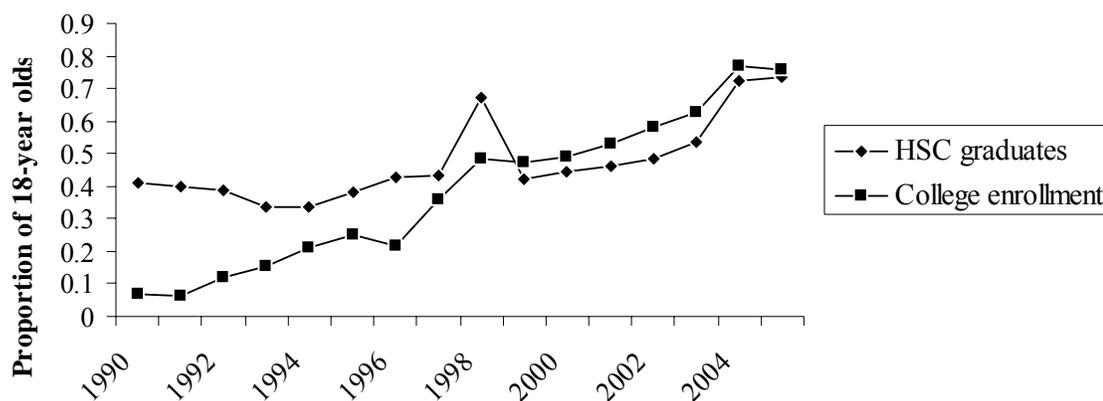
Table 2-3: Enrollment in Higher Education by Gender, Public and Private, 1993/94-2003/04 Academic Year (,000)

		93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04
Public	Total	23.9	26.0	30.0	32.6	36.9	46.2	51.1	56.9	60.4	66.8	74.1
	Female	15.9	17.9	20.9	22.4	24.9	29.0	31.5	34.7	37.3	40.5	44.5
Private	Total	4.2	6.8	8.4	11.5	14.1	19.1	23.0	28.1	29.9	31.2	34.1
	Female	3.2	4.9	5.9	8.1	9.9	13.4	15.7	19.0	19.9	20.6	22.3
Total	Total	28.1	32.8	38.4	44.1	51.0	65.3	74.0	85.0	90.3	98.0	108.2
	Female	19.1	22.8	26.8	30.5	34.8	42.4	47.2	53.7	57.2	61.1	66.8
	Female %	68.0	69.4	69.8	69.2	68.2	64.9	63.8	63.2	63.3	62.3	61.7

Source: MOSTEC, 2002; MOSTEC, 2004a, pp. 44 and 73.

If, indeed, increased social demand for higher education is the primary factor, a reflection must be present in the number of high school graduates who constitute potential college enrollees. Figure 2-2 shows the number of high school graduates and the number of college enrollees from 1990 to 2005 as denominated by the respective age group of 18-year olds. Indeed, over the last 15 years, the number of high school graduates, as percent of 18-year olds has increased from 40 to over 70%, indicating the potential pool of college enrollment was growing at a steady rate. However, college enrollment as a percent of 18-year olds was increasing at faster rate, from approximately 10% in 1990 to near 80% in 2005. Since 1999, higher education institutions accommodated more students than high school graduates as a proportion of the 18-year old population. A sudden jump in the number of high school graduates in 1998 reflects double the size of graduating students in that year, which resulted from a structural change in primary and secondary education. Perhaps, social demand for higher education

is due not only to the increased proportion of high school graduates going to college, but also those who finished high school quite a while ago.



Source: Author's calculation from MECS, 2005

Figure 2-2: Number of high school graduates and college enrollees as proportion of the 18-year old population, 1990-2005.

Another feature of Mongolia's higher education is its gender composition.

Different from many other Asian countries, female enrollment in Mongolia dominates that of males at all levels of education. In higher education, female enrollment was still over 62% in 2003, although down by eight percentage points from the 1995 level (Table 2-3 p. 31). This reverse of standard gender gap trend in higher education results from a high rate of male dropout at the secondary level, particularly in rural areas, since nomadic parents often terminate their sons' schooling to allow them to assist with agricultural duties (Lin-Liu, 2005b).

Table 2-4 specifies the percentage distribution of enrollment by type of institution and field of study. Although public institutions enroll a vast majority of students in the

field of engineering, science, and agriculture, their positions in education, art, and mathematics and computer science are weakening.

Table 2-4: Percentage of Enrollment by Type of Institution and the Field of Study, 1997/98 - 2000/01

		1997-98	1998-99	1999-00	2000-01
Teacher Training	Public	67.5	63.8	61.2	62.3
	Private	32.5	36.2	38.8	37.7
Humanities	Public	55.5	55.9	51.2	42.8
	Private	44.5	44.1	48.8	57.2
Art	Public	82.8	64.1	75.9	66.4
	Private	17.2	35.9	24.1	33.6
Law	Public	35.3	30.5	15.7	22.4
	Private	64.7	69.5	84.3	77.6
Social Science	Public	64.7	61.0	53.2	50.4
	Private	35.3	39.0	46.8	49.6
Commerce & Business	Public	60.1	58.4	53.7	54.0
	Private	39.9	41.6	46.3	46.0
Mathematics & Computer Science	Public	79.5	86.5	76.7	75.8
	Private	20.5	13.5	23.3	24.2
Natural Science	Public	79.5	86.5	76.7	75.8
	Private	20.5	13.5	23.3	24.2
Medical Science	Public	98.9	96.4	93.8	88.9
	Private	1.1	3.6	6.2	11.1
Engineering	Public	95.3	96.2	96.3	96.5
	Private	4.7	3.8	3.7	3.5
Trade and Industry	Public	100	98.4	98.9	97.9
	Private	-	1.6	1.1	2.1
Agriculture	Public	100	97.3	98.5	97.4
	Private	-	2.7	1.5	2.6
Architecture & Building	Public	100	100	100	100
	Private	-	-	-	-
Service & Trades	Public	15.3	19.0	31.4	17.6
	Private	84.7	81.0	68.6	82.4

Source: MECS, 2002

The number students studying (Table 2-4) at private colleges already exceed that of public institutions in humanities, law, and service and trades. However, both public and private institutions attract almost equal numbers of students in social science and business. Given these developments, Mongolian higher education, currently, is at a private-complementary phase of development as opposed to a private-peripheral or a private-dominant type, because the fast growing private sector complements the public sector in many fields of study (Geiger, 1987; Umakoshi, 2004).

Financing Higher Education

In accordance with the transition to a market economy, a new democratic Constitution of Mongolia was adopted in 1992. The Constitution declared that the citizens of Mongolia have an equal right to education as one of the basic human rights granted in Mongolia (Constitution of Mongolia, 1992). Partly because of the promises of the constitution and due to the past practice of free education, the people maintained the expectation that the government would continue to provide free education and health care. However, the economy was in a deep recession and the government experienced a severe financial crisis. Factors such as an annual inflation rate as high as 324% in some years, the cessation of financial assistance from the Soviet Union, which at one time equaled one third of total government budget, and increasing enrollment in higher education contributed to the substantial decrease in government funding for education in real terms (NSO, 2001; ADB, 1996; Wu, 1994; Bray, Davaa, Spaulding, & Weidman,

1994). Evidently, the government, as the only source, was unable to finance higher education.

This situation of fiscal deficit forced the government to adopt a “cost sharing” principle which implied a sharing of higher education costs between the government and the beneficiaries. A major initiative in this direction was government Resolution No. 107 of July 3, 1992. This resolution endorsed new regulations for postsecondary education financing. According to the regulation, the government would fund fixed costs of public institutions, and institutions could charge tuition and fees, not exceeding the per student variable costs. In addition, funding authorizations included tuition grants for students enrolled within state quota, as well as tuition and stipend loans to needy students (State Training Fund, 2002). These major changes in higher education financing, initiated in 1992, found further legitimacy in the Education Law of 1995 (Higher Education Law, 1995).

Between 1993 and 2003, the student financial aid system has undergone substantial changes and modifications from various government resolutions. In 1995, the government issued a detailed regulation for financial aid specifying the eligibility criteria, repayment conditions of grants and loans, and establishing a large program of government assistance to students from public employees’ families (State Training Fund, 2002). Government Resolutions No.194 of 1995, No.179 of 1997, and No. 96 of 2000 limited the coverage of grants to only needy students and abolished the state quota system. Loan programs covered tuition only and reduced the scope of direct subsidies to public higher education. This time, instead of total fixed costs, only utility costs for electricity, heat, and water were eligible for subsidy. At the same time, financial aid

extended to master's and doctoral students, students pursuing graduate degrees abroad, and included tuition grants to outstanding high school graduates or college students with a GPA of not less than 3.8 for four consecutive semesters (State Training Fund, 2002; MECS, 2001).

Government Resolution No. 158 of 2000 further expanded the tuition grants for one student from a nomadic family with less than 200 head of livestock (later increased to 700) and one of three children enrolled in higher education at the same time from a single family (MECS, 2004b).

A semi-governmental agency, State Training Fund (STF), governed by an independent board but operationally attached to MECS, is responsible for the implementation of all state financial aid programs. The governing board consists of six officials, pre-specified by their positions from both the Ministry of Finance and the Ministry of Education and does not include institutional or public representatives. Loan and grant aid are administered by the colleges and universities, which each year award aid to students within the quotas as per agreement with the STF. They submit relevant documentation and requests for funding to the STF.

Table 2-5 presents government expenditures for financial aid. Over the past eight years, total government funding for financial aid increased 6.8 times. However, since 2000, funding of student loans and grants decreased by 6.7% and 26.4%, respectively, while funding for overseas training and tuition grants for public employees' families continued to grow.

Table 2-5: Government Expenditure on Financial Aid, 1997-2003, in Billion Togrog

	1997	1998	1999	2000	2001	2002	2003	2004
Grant Funding	0.50	0.81	1.72	2.53	2.81	2.72	2.49	2.36
Loan Funding	0.48	0.74	1.54	2.26	2.39	2.22	1.95	1.76
Loan and Grant for Oversees Training	0.73	1.55	2.39	1.81	2.35	2.37	2.78	3.39
Tuition Grant for Public Employees	-	-	-	3.14	3.19	3.88	4.04	4.28
Total Funding for Aid	1.71	3.1	5.65	9.74	10.74	11.19	11.26	11.79

Note: a) Total funding for 1997-99 includes only those programs for which data is available. b) Loan repayment is not included. c) All figures are at current price.
Source: Author's calculation from MECS (2004b) and MECS (2005).

Table 2-6 shows the total number of aid recipients by major programs from 1997 to 2004. Two observations are relevant. First, financial aid in Mongolia has expanded substantially, in terms of numbers of students receiving such aid, after the year 2000. This expansion occurred not only because of the increases in funding, but also due to the relatively small size of average aid award. Second, the number of students covered by the grant programs including students from public employees' families in 2004 increased two and a half times relative to 2000, while loan recipients decreased by 22% for the same period. As of 2004, approximately 40% of students enrolled in higher education received some type of financial aid.

Table 2-6: Number of Financial Aid Recipients by Major Aid Programs, 1997-2003

	1997	1998	1999	2000	2001	2002	2003	2004
Grant Recipients	326	581	965	1,140	3,489	6,733	10,488	15,867
Loan Recipients	6,872	6,128	8,050	9,441	9,908	9,236	8,409	7,390
Oversees Training	79	107	278	291	326	335	360	400
Students from Public Employee's Family	-	-	-	12,082	12,262	14,928	15,915	16,662
Total number of aid recipients	7,198	6,816	9,293	22,928	25,985	31,232	35,172	40,319

Notes: a) Total number of aid recipients for 1997-99 includes only those programs for which data is available. b) The figure for oversees training for 2004 is an estimate.

Sources: Author's calculation from MECS (2004b) and MECS (2005).

The expansion of financial aid in 1997-2004 occurred at the expense of a gradual decrease in direct subsidies to higher education. Although the relative share of higher education in total government spending for education remained stable, ranging between 14 to 18%, the share of expenditures for financial aid increased from 3% in 1997 to 11% in 2004. Especially striking is the proportion of financial aid within the total for higher education spending by the government. As of 2004, financial aid took almost three quarters of the total government expenditures for higher education, as opposed to one fifth in 1997. Accordingly, direct subsidies to public colleges and universities decreased to a minimum of 25.6% (Table 2-7). taking into account the fact that the government ceased paying for basic utility costs of public institutions in 2001 and only a few military schools remained under government funding, clearly, financial aid to students practically

replaced government direct funding for higher education, implying 100% demand-side financing for higher education.

Table 2-7: Government Budget for Higher Education, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004
Share of higher education in government education budget, %	14.0	14.0	14.0	17.1	17.3	17.8	17.8	14.4
Government budget for higher education, billion togrog	5.9	7.9	9.1	13.1	16.0	17.4	18.7	18.8
Direct appropriations to higher education, billion togrog	4.7	5.5	5.0	5.6	6.9	7.5	7.1	4.8
Share of appropriations in higher education budget, %	79.7	69.6	54.9	42.7	43.1	43.1	38.0	25.5
Funding for financial aid, billion togrog	1.2	2.4	4.1	7.5	9.1	9.9	11.6	14.0
Share of financial aid in government higher education budget, %	20.3	30.4	45.1	57.3	56.9	56.9	62.0	74.5

Source: Author's calculation from the data provided by the MECS (2005).

If the share of financial aid in government higher education expenditure is an indicator of a change in financing higher education, two distinct phases are clearly observable: 1992-99 and post-2000. A major difference between these two stages is the role financial aid played as a public policy vehicle: between 1992-99 financial aid acted as a supplement to government funding for public higher education, limited to

undergraduate education only, and since 2000, financial aid emerged as a dominant government policy for the entire system of higher education, covering both undergraduate and graduate levels of study.

During this period, fee-based financing is the universally adopted mode for both public and private higher education. While private institutions have charged tuition since their inception, all students enrolled in public higher education were charged tuition since the 1993-1994 academic year. At least four characteristics, inherent to tuition charges, exist in Mongolia.

First, the levels set for tuition for public higher education have provided full recovery of all costs, thus indicating a rapid shift from free higher education to one that approaches the opposite end of the spectrum (Bray, Davaa, Spaulding, & Weidman, 1994; Weidman, et al. 1998).

Second, evidently, tuitions of private institutions are more reflective of market values for their programs. For example, while a few reputable private institutions with high demand programs charge far more than public tuition, tuition charges for most small private colleges are at the level of public tuition (or even less). Apparently, a similar trend in private tuition and fees is present in Russia (Bain, 2001). Such tuition-setting arrangements imply a lack of real competition for students between public and private higher education institutions. With respect to academic quality and admission standards of higher education, both common sense and public consensus suggest a hierarchy consisting of four different groups of institutions: a) public universities with high quality, high standards, and reasonable tuition, b) private universities (only three) with high reputation and high price, c) public colleges with adequate quality, standards, and pricing,

and d) private colleges with doubtful quality, standards, and low tuition. However, because both public and private universities and colleges still offer a limited number of specialized programs, real competition for students occurs between similar programs rather than between public and private sectors of higher education.

Third, the government and the Ministry of Education, Culture, and Science can and do influence tuition levels for public higher education even though they no longer have formal authority over setting tuition. As a common practice, the MECS restrains public colleges and universities from excessive increases in tuition through state representatives in their management boards or by issuing recommendations to tie tuition increases to the inflation rate.

Fourth, an effective, but not so well organized public control mechanism, maintains tuition at reasonable levels. A sudden increase in tuition at a university or college eventually causes student unrest, protests and unavoidable exposure in the media, which questions reasons for tuition increase.

Although some estimates suggest that tuition constitutes 29 to 44% of total costs (Altantsetseg, 2002), it is undoubtedly a major financial burden to be paid in cash, because families generally provide in-kind support for other expenses such as accommodations and food. All types of financial aid (grants, loans, tuition grants for public employee's children, alike) are in amounts not exceeding the average annual tuition fee for a field of study at a public institution (MECS, 2001). The loans and grants are mutually exclusive, i.e. no student can receive two types of assistance at the same time. Also very rare is that a student transferring from one type of assistance to another.

In the past, the number of enrollees by major or specific program in each institution has quota control imposed on institutions from the government. The State Training Fund uses a similar quota system to determine the number of financial aid awards, excluding public employee's tuition grants, by each university or college and within a university by schools. According to this quota, the vast majority of awards go to public universities.

Once, the financial aid award quota is received, the institutions play a substantial role in awarding financial aid. They inform students of the availability of grants and loans, receive applications and relevant documentations from students, and submit the paperwork to the STF, together with the request for funding. This process of applying and awarding occurs during first semester of an academic year. Once a student receives financial aid, except public employee's tuition grants, it is automatically renewed each year. However, the institutions can deny, suspend, or cancel the provision for grants or loans on the basis of insufficient documentation, dropout, academic leave for a year or two, or transfer.

Mongolia has four kinds of financial aid programs: student loans, grants, public employee's family tuition grants, and other programs. Detailed description of each program appears below.

Student Loans

The loans represent the third largest financial aid program by number of recipients and fourth, by total funding (see Table 2-5 and Table 2-6 above). Loans in the amount of

average public tuition⁶ are provided to students on the basis of need. To receive a loan, a student must provide evidence of need and eligibility for the loans. Since the income of the family is difficult to determine, a letter from the local governors of residential administrative units (khoroo or districts in cities and counties or provinces in rural areas) confirming that a student is from an eligible family serves as the evidence. Major eligibility criteria are:

- Enrollment in an accredited institution,
- From a family with a monthly income less than the minimum living standard, as determined by the National Statistical Office,
- From a family with a disabled member, a family with both parents retired, or an orphan, and
- A notarized guarantee of loan (from a person or company with sufficient assets to cover the obligation) (MECS, 2001).

Determining minimum living standards considers price changes in basic consumer goods and services and indicates the level of consumption needed to sustain monthly minimum living standards in rural regions and Ulaanbaatar City. These standards are reviewed on a yearly basis. For the year of 2004, the minimum standards in the national currency, togrog, were:

⁶ Tuition for a specific field of study at major public universities, such as National University of Mongolia, Mongolian Science and Technical University, and National University of Education, usually serves as an average for public tuition.

Western Region	20,200
Mountain Region	20,600
Central Region	20,600
Eastern Region	21,200
Ulaanbaatar City	26,500 (NSO, 2004)

Loan recipients have up to ten years, with a grace period of six years after the graduation, to repay loans. Starting from the seventh year, interest rate charges are 0.5% higher than the annual average interest for commercial bank loans. If loan recipients have been employed for eight consecutive years, including five years in a rural county, loans can be forgiven. However, if loan a recipient has terminated college study, repayment of the borrowed amount within two years includes a 3% annual interest rate (MECS, 2004b).

The above outlined conditions are very “soft” with the intention of encouraging students to complete a degree and pursue productive work. The overall rate of State Training Fund loan repayment is only 2%, effectively converting the loans into grants. The Government periodically forgives the loans, as well, so students have the expectation that they will never have to repay the money. For example, in 2004, the Government of Mongolia issued a resolution to release every student (approximately 21,000 students), who received a loan and graduated before 2004, from loan repayment, thereby, forgiving 8.2 billion togrog in unpaid loans and interest (MECS, 2004b). Furthermore, this program experiences a low rate of repayment in any case. Another limitation is the amount of a

loan. Students from low income families may need more than just tuition. Currently, the loan program does not meet this need.

Grants

State tuition grants form the second largest financial aid program and several different criteria provide the basis for award. In addition to being enrolled in an accredited institution, the students must be in one of the following categories to receive a grant:

1. One student from a poor family with a monthly income of less than 60% of the minimum living standard,
2. One student of a herdsman's family with livestock of less than 700 head,
3. One of three or more children from a family attending college, full-time, at the same time,
4. Orphan or student without parents or guardians,
5. Physically disabled student from poor family,
6. One student from a single parent family with less than the minimum living standard income (eligible to a fixed amount of 150,000 togrog and the difference between tuition and this grant is a loan),
7. Award winners in an international competition for high school students,
8. Student who took one of first three places in a national competition/olympics while in high school,

9. Student who demonstrated a GPA of 3.8 or higher for four consecutive semesters,
10. Master's student with GPA of 3.8 or higher or with a demonstrated research achievement, and
11. Doctoral student with a demonstrated research achievement (MECS, 2001; MECS, 2004b).

A summary of grant awards in recent years by major components of the grant program appears in Table 2.8.

Table 2-8: The Number and Percent of Grant Recipients by Major Components of Tuition Grant, 2003 and 2004

Components	Categories included	2003		2004	
		Number	% of Total	Number	% of Total
Need-based grants	Categories 1-2, 6	8,119	77.4	13,294	83.6
Other disadvantaged groups	Categories 3-5	2,216	21.1	2,454	15.4
Merit-based grants	Categories 7-11	153	1.5	149	1.0
Total		10,488	100	15,897	100

Note: These figures do not include grant recipients from public employees' families.

Source: Author's calculation from MECS (2004b).

Need-based grants comprise 84% of total grants awarded, and the awards to orphans, physically disabled, or one student from a large family with three or more college student form 15% of the total awards. The relative share of need-based grants in

2004 has increased by six percent from the previous year. This increase occurred, basically, at the expense of awards to other disadvantaged categories. An obvious explanation for the decrease in the proportion of this category may be the relatively limited number of students that meet the eligibility criteria.

Tuition Grant for a College Student from Public Employee's Family

Currently, the largest group of recipients, in terms of both funding and the number of recipients of financial aid, is those receiving tuition grants for one student of a family in which one or both parents have employment in the public sector. As of 2004, about 17,000 students from the families of over 130,000 public employees are covered by this program (Table 2-6; NSO, 2001).

This program is unique in several aspects. The awarding has no basis in need or merit, but the simple fact of coming from a family of a specific category of employees. In this sense, the grant is more like a reward or a benefit from government employment. The program funding comes from local (until 2001) and centralized budgets (since 2001) through the STF, and therefore can be considered government-run financial aid although initial requests for awards come from a public entity employing the recipient's parent. Different from other aid programs, the tuition grant is for only one student pursuing only an undergraduate degree for the total duration of parent's employment in the public sector. The grant award is on a semester basis and renewable if the recipient continues fulltime enrollment and maintains a GPA of at least 2.0 and that the parent remains

employed by the government. Finally, the grant is not transferable to another child of the public employee if the first one drops out or transfers to another college (MECS, 2001).

Other Programs

Since 1997 the government devoted sizeable funding to help Mongolian students study abroad. Two forms of financial aid cover this program (MECS, 2001). First, a limited number of people who have successfully passed a national competitive exam are eligible for up to US\$15,000 per year for travel, tuition, and living expenses for graduate level training in a developed country. The number of students and their fields of study are determined by the government each year considering available funds and the requests from the ministries (STF, 2003). Those selected for overseas training need to find, apply, and receive admission to a foreign university and have resources to cover the costs that exceed what the government can provide. A contractual agreement is forged between student, the STF, and the Ministry, requesting a graduate degree to be earned in a developed country for their employee. This financial aid is a loan, although the tuition part can be forgiven if the recipient works for the requesting ministry for five years after graduation.

Second, those who study in other countries (not necessarily developed), within bilateral government agreements, are eligible to receive loans to support travel or living expenses if the host government does not cover these costs as it usually does the tuition. Public employees who participate in short-term training also have access to this financial aid. These loans have full loan forgiveness conditions (MECS, 2001).

Besides the government, the universities and colleges often provide financial aid to students. However, the number of such scholarships is very limited and basically awarded to those with demonstrate high academic ability.

Chapter 3

REVIEW OF RELATED LITERATURE

The effects of financial aid in general and the relationship between financial aid and postsecondary degree attainment in particular have attracted the interest of both education and public policy researchers for decades. Although a vast body of research in this field has been accumulated in the United States, a deficiency exists for research considering whether or not financial aid has any positive effect on educational attainment in developing countries.

An online search of major international journals and databases failed to detect any substantial number of studies conducted in this area. This situation is quite understandable, given that higher education in many developing and transitional countries has long been an enterprise funded and regulated by the state. Financial aid programs are relatively new phenomena, resulting from the introduction of cost-sharing principals in the financing of higher education (Johnstone, 2003, Vossensteyn, 2004).

This review covers recent US-based research on the topic. The intent here is not to review every study relevant to the topic, rather to highlight the most prominent findings in the field that are relevant to this study. The purpose of the review is not to compare the United States and Mongolia. Rather it seeks applicable concepts, hypotheses, and methodologies pertinent to the study of student financial aid. Developing nations provide opportunities for testing and extending the theoretical perspectives developed in advanced societies (Buchmann & Hannum, 2001).

This review consists of four sections: 1) discussion of human capital investment perspective, 2) key areas of college attendance, such as choice and enrollment where financial aid supposedly plays a significant role as a policy instrument, 3) research on the relationship of financial aid and degree attainment, and 4) research on financial aid in developing countries.

Human Capital Investment Theory

The provision for financial aid to students and its impact on college attendance are better understood in light of both the macro- and micro-economic theories of investment. Nobel Prize winner, Gary Becker (1993), and higher education scholar, Howard Bowen (1997), are among the most prominent scholars of human capital investment theory. Gary Becker theorized that college education, just as any other investment opportunity, can be a capital market where negatively correlated demand and supply curves of human capital define the equilibrium point. At this equilibrium the marginal rate of return equals the amount invested in human capital, thus maximizing profits or gains on the investment. Further, determination of the potential returns on investment occurs by comparing future earnings and current costs (including direct and opportunity costs).

Since individuals differ in their abilities to access and invest in this capital market, the supply curve is dispersed and the market is segmented. As a market for investment, higher education opportunities also differ in terms of costs/prices, quality, and potential returns. As a way of narrowing the supply curve dispersion, government financial aid to

needy students equalizes investment opportunities, thus eliminating expected inequalities in earnings (Becker, 1993, p. 138). Equality of opportunity would enhance the fairness of the system in terms of competition and would improve overall efficiency in the society by placing talent where it is most productive (Bowen, 1997, p. 330).

Apart from equalizing individuals' opportunities to invest in higher education, human capital theory justifies government intervention on the basis that the higher education capital market is imperfect. According to Paulsen (2001), imperfect higher education market is due to three reasons: 1) Private investors fail to provide funds to students. 2) Students invest in higher education considering only its private benefits (not the benefits to the society). And, 3) information about college opportunities is imperfect. Therefore, the government must intervene with the market to address the underinvestment, make funds available in the form of grants and loans for students, and disseminate information about college opportunities and financial aid programs.

Viewed through the lens of human capital theory, government investment is also warranted in the presence of a perceived need for a social return on higher education, such as creation of new knowledge, lessening social problems, and economic and productivity growth (Campbell & Eckerman, 1964; Bowen, 1997; Vossensteyn, 2004). However, since social returns on higher education are difficult to measure and are consistently lower than the private rate of return (Psacharopoulos, 1994), the constraint on government investment is the concern for efficiency; i. e. the attempt to maximize outcomes on any amount invested. Therefore, understandably, financial aid investments, distributed over large numbers of students, are in amounts often insufficient for any one individual.

Although government investment in higher education can be, basically, direct appropriation and financial aid to the students, a difference exists between these two forms when viewed from the capital market perspective. The provision of financial aid is a demand-side intervention that stimulates greater college attendance; whereas, direct appropriations to colleges and universities are thought to encourage the supply-side of higher education (see Patrinos, 2001; Perna, Steele, Woda, & Hibbert, 2005). The demand-side financing, such as student loans, grants, vouchers, and community financing, channels funds to individual students and can effectively stimulate choice and equity, while addressing the government's inability to cope with increasing costs of supply-driven expansion (Patrinos, 2001).

From an individual's or micro-economic perspective of human capital theory, individuals seek to increase the amount of human capital in order to earn higher returns in labor markets. Individuals do this primarily by investing in education to acquire skills or credentials that increase their productivity, which leads to greater labor market rewards (Heller & Rasmussen, 2002). In this rational process of acquiring as much human capital as possible for a given investment, degree attainment is an important milestone that separates the stage of realization of the returns on investment from the stage of investing in education.

The opportunities to invest in higher education are different for individuals because of differences in the availability of funds (Becker, 1993, p. 121). Financial aid

decreases the price⁷ of required investments, and therefore, permits individuals to choose higher investment opportunities that would otherwise be unaffordable. The resulting rate of private return would be higher because of lower costs to individuals. This price discount, provided by financial aid, is particularly advantageous to needy students because it can significantly influence their decisions to attend and obtain degrees from higher education institutions (see Kane, 1999).

This increasing return on investments is due to financial aid and is easily illustrated using Becker's original equation (Equation 3.1) of earnings as a function of the rate of return and the capital invested (1993, p. 122):

$$E = R * C, \quad \text{Equation 3.1}$$

Where E is earnings; C is the total capital invested, and R is the average rate of return on C .

From this equation, the rate of return would equal:

$$R = \frac{E}{C}. \quad \text{Equation 3.2}$$

⁷ For an economic analysis of price and financial aid subsidies in higher education see for example, Clotfelter, C. T., and Rothschild, M. (Eds.). (1993). *Studies of Supply and Demand in Higher Education*. Chicago: University of Chicago Press.

All other things being equal, the amount of total capital invested, C , for the recipients of grant aid for their college educations, would be the same as that for non-recipient peers, although the rate of return on individual capital, $C - F_{grant}$, will increase because grant aid decreases the level of required private investment.

$$R_I = \frac{E}{(C - F_{grant})}, \quad \text{Equation 3.3}$$

$$R_I > R \text{ or } \frac{E}{(C - F_{grant})} > \frac{E}{C}. \quad \text{Equation 3.4}$$

Similarly, for recipients of student loans, the amount of total capital invested, C , remains the same as that for those non-recipient peers. However, the level of individual capital invested for loan recipients lowers by the amount borrowed, although this loan will later be deducted from their earnings. Assuming that the present value of a loan (loan principal) is the same as the future deduction (loan repayment) from earnings, Equation 3.5 calculates the rate of return on private investment:

$$R_I = \frac{(E - F_{loan\ repayment})}{(C - F_{loan\ principal})}. \quad \text{Equation 3.5}$$

If earnings exceed investment, $E > C$, the resulting rate of return for loan recipients is higher than for non-recipients, because the deduction of the same amount from both numerator and denominator yields a higher proportion for the numerator than the denominator.

$$\frac{(E - F_{\text{loan repayment}})}{(C - F_{\text{loan principal}})} > \frac{E}{C} . \quad \text{Equation 3.6}$$

This simple illustration shows how financial aid can increase the rate of return on individual investments. Thus, taking the human capital perspective, one can expect that financial aid awardees, despite need-basis or merit-basis, must be encouraged to invest in and acquire higher education even more so than non-awardees due to the increased rates of return and decreased costs to aid recipients.

Moreover, following the human capital investment approach, individuals should be willing to take advantage of financial aid more so than the willingness of the government to provide it, since private returns on higher education are higher to graduates than the return that accrues to society as a whole. However, this theoretical insight has greater implication for the rate of return and financial aid liquidity considerations for individuals than for the governmental rational for providing financial aid. For example, in the United States, the provisions for federal financial aid for needy students have their primary basis in equity considerations to provide equal opportunity

for higher education regardless of income, gender, and racial differences (see Archibald, 2002; Fitzgerald & Delaney, 2002).

Although the human capital perspective does help understanding of both the government's and individual's behavior involved in providing and receiving financial aid, certain limitations remain for its application to higher education as a capital market. According to Lleras (2004), individual investment in higher education involves certain risks to investors. Compared to buying a house, the investment in higher education provides an experience that cannot be sold or collateralized; it requires constant reinvestment; the benefits are unknown, and values tend to decrease over time (Ibid, p. 23). Due to these risks, students, particularly those of low-income groups, are reluctant to borrow too much to invest in higher education. To eliminate some of these risks, Lleras proposed to implement human capital contracts (HCCs) and income-contingent loans that will allow the students to mobilize necessary funds for a college education in exchange for a portion of future income.

The advantage of HCCs or income-contingent loans is that they reflect the true value of careers and quality of education at a particular institution, the value of educational costs, and the program length in relation to future income. And most importantly, HCCs can be freely traded on the capital market. In addition, this scheme of financial aid is income sensitive, because HCCs demand more from high-income students and less from low-income students (Ibid, p.76). Although income-contingent loans provide an opportunity to finance college education through trading, for cash, a part of future earnings, the collateralization is still a problem that can not be completely

overcome without third party (the government) involvement, which could guarantee the loan repayment in case of a borrower's unemployment or death.

As previously discussed, the human capital investment perspective allows understanding of the complexities of investing in higher education. Recent developments in this theory, such as Lleras's (2004), can drive future modifications of financial aid processes in the years to come. In fact, income-contingent loans, implemented in Australia (Johnstone, 2001), can be better understood in light of the human capital investment perspective rather than any other theory.

Although embedded in the human capital perspective, but a slightly different approach in conceptualizing the effects of financial aid, is the student demand theory (Leslie & Brinkman, 1987; St. John & Starkey, 1995; Heller, 1997). Building upon the basic laws of the market economy, the negative relationship between supply and demand (or price and quantity of goods and services in the market), this theory asserts that:

- (1) Enrollment rates will negatively associate with prices charged [to] students, especially tuition prices;
- (2) Enrollment rates will positively associate with amounts spent on student aid, since student aid reduces net prices or increases student money income, and
- (3) Enrollments in higher education institutions or groups of institutions will associate positively with the tuition prices charged by competitors (see Leslie & Brinkman, 1987, p. 181).

While the human capital investment approach emphasizes the rate of return on college education, demand theory seeks to identify and explain how students with varying socioeconomic and other characteristics respond to college costs (tuition price, net price, and cost of attendance). Furthermore, the theory considers financial aid as a discounted cost and focuses on student's enrollment rather than on graduation. In student demand studies⁸, the relationship between college price and enrollment is often reflected as student price response coefficient (SPRC). This coefficient is negative across the studies, implying a positive association between financial aid and enrollment.

In brief, human capital investment theory helps to explain and justify individual decisions with regard to college education in relation to investment potential. The theory suggests that financial aid, due to its ability to lower the required investment and increase the rate of return, provides incentives for better education that would allow acquiring, as much as possible, human capital. Following from this perspective is that financial aid should positively influence college choice, enrollment, persistence, and degree completion.

The next section reviews some empirical evidence that tested this theoretical association.

⁸ Leslie and Brinkman (1987) and Heller (1997) have reviewed much of the available student demand studies.

Financial Aid, College Choice and Enrollment

Common understanding is that a major purpose of financial aid is to help students cope with the financial burdens associated with obtaining college educations. In the United States, the federal government, the states, and institutions of higher education provide different types of financial aid programs to accomplish varying objectives. Since the passage of the Higher Education Act of 1965, which initiated large scale financial aid programs funded from federal resources, the equal opportunity for higher education has served as a chief goal of financial aid schemes. Following the federal government's lead, states have provided need-based grants for the same reason. However, in recent years, an increasing number of states have adopted merit-based grant programs intended to encourage ability as well as to serve financial need (Marin, 2002). Besides, colleges and universities offer various forms of tuition discounts, basically recycling a part of tuition and fees paid by students. For them, financial aid is an instrument, often for competitive purposes, used to attract students with high abilities (DesJardins, 2001; Newman, Couturier, & Scurry, 2004).

Notwithstanding these differences in the goals and objectives, research on financial aid has developed and focused mainly on the role aid plays in students' college choices, access, enrollment, persistence, and degree completion. The availability of financial aid appears to be an important factor in high school graduates' decision-making processes about which college or university to attend (Hossler, 2000). Specifically, the receipt of financial aid leads students to favor private universities over public institutions (Hu & Hossler, 2000), four-year institutions over two year colleges (Heller, 1998), more selective universities over less selective ones (Hearn, 1991), more expensive universities

over less expensive ones (Leslie & Brinkman, 1987), and first-choice institutions over second-choices (Kim, 2004). In addition, the students, offered a grant, were more likely to enroll in that institution as compared to those students who received loan offers (St. John, 1990). These findings adhere to the human capital theory argument that individuals tend to maximize their “profits” by investing in better higher education opportunities.

However, the effects of financial aid on college choice are also dependent on individual characteristics of students. Kim (2004), for example, demonstrated that whites and Asian-Americans were more likely to attend their first choice institution when they received grants or a combination of grants and loans. African-American and Latino students’ college choice decisions were less affected by financial aid offers.

Financial aid is only one of the many different factors that can influence the college enrollment decision. The assumption is that financial aid should positively affect enrollment because it supposedly increases one’s ability to pay for a college education by lowering required costs. As research evidence suggests, college becomes less attractive when tuition and other costs of attendance increase and more attractive as the availability of financial aid increases (Paulsen, 1990). Consequently, increases in financial aid lead to an increase in student enrollment (Jackson, 1988). The effect of financial aid on enrollment appears to be much more complex than the common assumption presupposes. The effect differs by type of institution, income level, race, the nature and type of financial aid, and the sufficiency of aid amount relative to college price (Heller, 1997; Heller, 1987; Somers & St. John, 1997; Dynarski, 2000; Price, 2001; Terenzini, Cabrera, & Bernal, 2001). Evidence suggests that low-income students are more responsive to grant increases, while loans and merit-based scholarships largely benefit middle- and

high-income students (Terenzini, Cabrera, & Bernal, 2001; Kane, 2004; Dynarski, 1999; 2000; 2002; Cornwell, & Mustard, 2002). However, merit-based⁹ scholarships tend to have little or no effect on college attendance (Heller, & Rasmussen, 2002; Binder, Ganderton, & Hutchens, 2002). The negative association between aid and enrollment may appear when the amount of aid is insufficient or a significant unmet need remains (Choy, 1999; National Center for Education Statistics, 2000; Somers & St. John, 1997).

Financial Aid and Degree Completion

An extensive body of research has examined the impact of financial aid on student persistence and degree attainment. Consistent with the complexity of financial aid problems and the factors affecting degree attainment, research studies utilize a variety of methods and techniques to underscore the relationship between aid and degree attainment.

Persistence, whether at a particular educational institution or in the postsecondary system, is a necessary condition and an important determinant of one's degree attainment prospects (Pascarella & Terenzini, 1991). The effects of financial aid can vary over time due to changes in the form, composition, amount, and the eligibility criteria of awarding financial aid, and changes in tuition costs for higher education (Heller, 2003). Therefore, bearing in mind that Mongolia is a developing country, this review emphasizes the

⁹ For the impacts of merit-based scholarship programs on access and equity see Heller, D. E. & Marin, P. (Eds.) (2002). *Who Should We Help? The Negative Social Consequences of Merit Aid Scholarships*. The Civil Rights Project, Harvard University.

studies on persistence and degree attainment for low-income students that reflect the most current trends in scholarly thinking, conceptualization, and methodological approaches.

Pascarella and Terenzini (1991, 2005) synthesized the findings of many studies on educational attainment including those that measured the effects of financial aid on persistence and bachelor's degree attainment conducted prior to 1990 and since 1990.

Noting that the findings are somewhat mixed prior 1990, they concluded:

Net of differences in academic aptitude, students who receive financial aid are as likely to persist in college as those who did not receive such aid. If one assumes that financial aid is aimed at equating the financial resources of students from different family socioeconomic origins, then this conclusion tentatively implies that financial aid in general may be successfully compensating for the negative impact of low individual financial resources on persistence in college. (1991, p. 420).

These controversial findings of previously conducted studies have attracted more attention in recent years. Hence, researchers have attempted to shed light on the issue. Somers and St. John (1997), for example, argued that the universal and measurable effect of financial aid on enrollment and persistence that most meta analyses detected across the studies may not indeed be possible due to: a) Different types of aid may have different effects; b) the effects of tuition price and price subsidies can change over time, and c) negative coefficients for aid variables may occur because the amount of aid offered is insufficient to promote desired outcomes. Part of the inconsistency of findings across different studies may be due to the absence of reliable financial aid data prior to 1986 and the use of proxies for financial aid instead of actual aid received (Perna, 1998).

More recent studies on persistence and degree attainment draw a different picture.

Using the National Postsecondary Student Aid Study and the Beginning Postsecondary Students Longitudinal Study (BPS) data, Heller (2003) examined the effects of federal, state, and institutional grant aid on persistence into the second year, attainment or persistence into the sixth year, and attainment of a bachelor's degree by 2000-01 for students enrolled in public institutions in 1995. Controlling for demographic, academic, and institutional variables in multivariate logistic regression models, Heller found that the receipt of work-study, any form of aid, and institutional need-based and non-need based grants provided the students with significant advantages over non-recipients to persist into the sixth year and to attain a bachelor's degree. In particular, students who received any type of aid from any source for three or more years were 20.4% more likely to attain a degree (Ibid, p. 26).

Adelman (1999) undertook an ambitious endeavor to determine the factors that contribute most to bachelor's degree attainment. In the six stages of ordinary least square (OLS) regression as well as in logistic version analyses, he tested more than 30 variables by sequentially eliminating statistically insignificant ones. Financial aid (specifically, work study for purposes of covering the costs of education) was among eleven significant variables that contributed to bachelor's degree completion by age of 30 for the national High School and Beyond Sophomore (HS&B/So) survey participants. Interestingly, both grant-in-aid and loans had positive although insignificant effect on bachelor's degree attainment. Particularly, the receipt of a grant was significantly associated with the bachelors' degree completion in the second and third stages of the analyses, until it lost significance in the final stages (Adelman, 1999).

Using the same database (HS&B/So cohort of 1980) and many similar variables as those in Adelman's study, Cabrera, Burkum, and La Nasa (2003) sought to examine the factors associated with bachelor's degree completion within four years for socioeconomically disadvantaged students. Financial aid variables, receipt of loans, grant-in-aid, and satisfaction with cost, were included in a series of logistic regression analyses together with other variables (such as socioeconomic status, background, high school encouragement, academic resources, degree aspirations, college paths, collegiate experiences, college grade point average, number of college math and science courses, work on campus, and dependent children). The researchers found that both loan and grant-in-aid recipients were more (by 10% and 7%, respectively) likely to earn a degree as compared to non-recipients. The chances of degree completion for lowest- and mid-low SES loan recipients appeared to be even higher regardless other influences on degree completion.

Exploring data from BPS survey of 1989 freshmen, Perna (1998) analyzed the effects of financial aid on undergraduate persistence. Perna defined persistence as the attainment of a bachelor's degree within five years from the institution in which the student initially enrolled. By means of path analysis and OLS, Perna examined direct, indirect, and total effects of receiving financial aid on degree completion. She found higher rates of bachelor's degree completion for students who received financial aid relative to students who did not receive aid. Perna suggested that the effect of financial aid on persistence depended on the type and package of financial aid received.

Dynarski (1999) took another approach in conceptualizing educational attainment, in her investigation of student aid effect on attendance and completion. Dynarski defined

educational attainment as the level of education completed, measured by years of formal education attended. Examining the effect of receiving Student Social Security Benefits (SSSB) on completed education, she found that the likely recipients completed 0.91 to 1.06 more years of education than non-recipients of this student aid. For each \$1,000 of benefits, estimated completed schooling increased 0.18 to 0.21 years (p. 21). The methodology Dynarski used in her studies (1999; 2000; 2002) is somewhat different than what financial aid analysts usually bring into play. While many of the researchers used logistic regression as a method for detecting the effect of receiving or not receiving financial aid on the outcome variable, Dynarski calculated the difference in outcome variable between aid recipients and non-recipients, first. Then, using this difference as the dependent variable included other independent and control variables in the OLS regression or its derivatives.

Several studies (St. John, Hu, & Tuttle, 2000; St. John, Hu, & Weber, 2000; St. John, 1998; Metz, 2001) considered both the relationship between financial aid and persistence and degree completion at the state and institutional levels. This is important because the effect of aid may differ depending upon the context of a particular state, such as high-tuition/high-aid or low-tuition/low-aid and institutional setting (public vs. private, 4-year vs. 2-year) (Heller, 2003; 1998).

St. John, Hu, and Weber (2000) assessed the relationship between the financial aid package and undergraduate student persistence in public colleges and universities in the state of Indiana, one of the high-aid states. State need-based grants, loans, combination of loans and grants, and other aid packages constituted primary variables of interest in the step-wise logistic regression models together with age, gender, dependency

status, income, college GPA, institutional type, and student level. Students receiving grants and loans were five percentage points more likely to persist than students who did not receive aid. However, other aid variables were not statistically significant. The authors attributed this insignificant effect to the interaction between aid and college experience variables and the potential aid amount to determine negative, positive, or neutral coefficients for aid variables established by Somers and St. John (1997).

St. John (1998) conducted a study of financial aid practices of a private university. Private universities often differ from their public peers by relatively high cost of attendance and the reliance on loans rather than grants for providing financial aid. Comparison of two entire cohorts of a private university detected any changes in persistence affected by changes in financial aid policies. St. John found that all levels of loans negatively associated with persistence and increases in state grants for the latter cohort had a positive effect on persistence.

In contrast to private universities, urban public universities present a different context in that they attract a large percent of minority and economically disadvantaged students, and cost of attendance is relatively low. This situation may be particularly relevant to Mongolia, where about one-third of the population lives below the official poverty line.

Using the same methodology and persistence model as in previous studies, St. John, Hu, and Tuttle (2000) assessed the effect of financial aid policy change on persistence by comparing four different cohorts of undergraduate students in an urban public university. Although the positive effects of financial aid remained across the different cohorts due to adequacy of aid, given the trends in federal and state need-based

grants over the period, St. John and his colleagues concluded that state and institutional grants play an increasingly important role for students in the context of higher tuition and larger loans.

St. John's (1992) model of assessing persistence as a function of financial aid, student background characteristics, achievement, and college experience is the basis for the Metz (2001) examination of the effect of federal financial aid on degree completion rates of a two-year, small college, students. Degree completion replaced persistence in the model. For a sample, of 649 students, stepwise regression analyses showed the significant positive effects of federal loan and work-study on degree completion. However, federal grants did not appear as a significant predictor of degree completion. The author attributed these positive effects to increased involvement of students through work-study and the adequacy of federal loans in the low-cost two year college environment.

Another single institution study by Ishitani (2003), however, did not detect financial aid as having significant positive effect on graduation within four years. Ishitani, who studied the 1995 combined cohort of 2,752 college students at a four-year comprehensive public university in the Midwest, concluded "financial aid might have played its role to provide students access to higher education and retain them until graduation, but its impact on timely graduation was not as strong or direct as earned hours or college grades" (Ibid, p. 13).

Recent trends in federal financial aid show that loans comprise an increasingly prevalent portion of student financial aid (Gladieux, 2002). Although loans also lower cost of attendance, and therefore, can stimulate persistence and graduation, they also

bring a substantial debt that the borrowers may hesitate to bear. In this sense, loans may differently affect degree completion depending upon families' ability to repay the loans. Kim (2003) found that, net of other influences, no significant difference appeared for bachelor's degree attainment between borrowers and non-borrowers. However, considering parental income, the total amount of borrowing significantly predicted the chance of degree attainment for students from medium-income families, but not low- or high-income groups. The underlying assumption in these studies is that low-income students drop or leave college without having completed a degree basically due to financial constraints. As Terenzini, Cabrera, and Bernal (2001, p. 30) stated:

“Probably the most widespread set of beliefs about why low-SES students drop out of college or otherwise interrupt their studies has to do with finances.”

Financial Aid in the Context of Developing Countries

In the countries other than the United States, research on financial aid, particularly with a comparative perspective, is not readily available or accessible. However, a recent report of Educational Policy Institute (Usher, & Cervenak, 2005) provided an understanding of how financial aid policies affect higher education accessibility and affordability in an international comparison. The authors of the report compared four indicators of accessibility and six indicators of affordability (including total costs, net costs, and out-of-pocket costs) to rank 15 developed countries. Interestingly, the United States scored fourth on accessibility, 13th in affordability, and third in student financial assistance--including grants, loans, and tax expenditures that cover about 60% of total

average costs. While the study presents a reliable comparison of the effectiveness of financial aid policies in different countries, it contributes little to the understanding of the financial aid situations in developing countries, because the sample included only developed countries.

In the context of developing and transitional nations, the literature on financial aid is sparse and mostly descriptive rather than analytic. In general, the evidence indicates that more and more countries are adopting cost-sharing financing of higher education in which a salient role belongs to student financial aid (Bain, 2001; Min, 2004; Huong & Fry, 2004; Chamnan & Ford, 2004; Johnstone, 1998; Berryman, 2000). This trend is consistent with the World Bank Task Force's conclusion that entirely public or private financing of higher education is unlikely to yield the desirable achievement of quality, access, efficiency goals of higher education system in developing countries (Task Force, 2000). To achieve these goals simultaneously, sharing the financial responsibilities among stakeholders is inevitable.

However, the adoption of universal tuition and student aid policies is not straightforward. Sometimes adoption requires a temporary stage of dual-track tuition and subsidies, according to which some students pay tuition while others, usually high performers, have government sponsorship. While China and Mongolia have already gone through this stage accepting universal tuition, Russia and Kyrgyzstan are still in the phase of differential tuition (Hare & Lugachev, 1999, Johansson, 2004).

A study by Ziderman (2004) assessed student loan schemes in five Asian countries and identified their major strengths and weaknesses of these, as shown in the Table 3-1.

Table 3-1: Major Strengths and Weaknesses of Loan Schemes in Five Countries

Case study	Major strengths	Major Weaknesses
China	Bank provides funding (minimal financial burden on government) High repayment ratios Commercial loans	Small coverage Heavy repayment burden Difficulty in repayment collection May limit funding for loan scheme expansion
Hong Kong	Extensive coverage Various loan schemes well integrated by central agency Loans for both poor and non-poor students Use of student expenditure surveys to determine loan size, objectively Small geographical area facilitates repayment collection	Uncertain economic and political future
Republic of Korea	Funding provided by banking systems or existing financial funds Multiple schemes, with differing objectives, able to meet the needs of different sub-populations Satisfactory loan repayment and recovery ratios	Numerous schemes need rationalization and integration Schemes for the poor have low coverage, only cover tuition and are insufficiently well-targeted Scheme for government officials is excessively generous
Philippines	New schemes being designed and experimented in order to reach very specific population groups	Limited funding Small national impact: covers very few students Need for greater administrative skills No loan repayment Loan size is too small to meet student needs
Thailand	Extensive coverage of upper secondary and tertiary student population Loan scheme restructuring is now on the public agenda	Over-extended in relation to plans Weak central control Inadequate funding has led to retrenchment of the scheme Over-generous built-in loan subsidies Minimal loan repayment and recovery Poorly targeted to needy population Massive horizontal inequalities Default sanctions weak

Source: Slightly modified from Ziderman (2004, p 92).

These case studies allowed Ziderman to identify the characteristics of effective or successful student loan programs. “Good” loan programs should, among other features, be sufficiently large to achieve national impact and should be able to meet individual needs. Also, they need to have clearly defined objectives, justified subsidies, effective eligibility and screening criteria, and a sound information base. Loan programs should use both governmental and non-government funds, third parties for repayment collection, and mechanism to penalize repayment evasion. Finally, an integrated national policy of financial aid should exist. As Debande (2004) suggested, well-designed loan schemes should also be widely accessible, tailored to the needs of each student, less complex in administration, and complemented with aid mechanisms that target low-income groups.

Although the effects of financial aid policies in transitional contexts are largely unknown, the existing evidence from developing countries indicates that the impact may be similar to that which researchers found in advanced societies like the United States. For example, student loans in Mexican, private, higher education, improved not only enrollment, but also had a positive effect on student performance (Canton & Blom, 2004). Similar positive effects of financial aid on long-term recruitment have been detected in Sweden (Reuterberg & Svensson, 1994). Thailand introduced highly subsidized student loans with extremely favorable repayment conditions to increase the access of poor students to upper secondary and tertiary education (Ziderman, 2002). With financial support from the World Bank, Columbia and Jamaica have also implemented student loan programs to increase access to higher education for academically qualified but needy students (World Bank, 2002; World Bank, 1996) In brief, Lewis and Dunder’s (2002) conclusion may still hold true: The negative effect of demand-side financing on

equity in access, choice, and persistence is largely unexamined in developing countries and this effect is likely to be enhanced in transitional countries because of existing regressive subsidies to higher-income and higher ability students.

Chapter 4

METHODOLOGY

Conceptual Framework

Discerning the effect of financial aid on college attendance and graduation is a complex task, not only because government policies on financial aid change, college costs shift, and the economies have up- and down-turns, but also due to influences of other interrelated variables that shape persistence and degree attainment (Terenzini, Cabrera, & Bernal, 2001). Therefore, research on the relationship between financial aid and degree attainment, as a rule, includes a set of demographic, pre-college, college, and other variables, which, if absent in the analyses, can significantly compromise both the detected relationship, as a whole, and the magnitude of the effect.

Current models of student persistence and progression towards degree have resulted from the intersection of two major theoretical thinking patterns, namely sociological and economic perspectives of college attendance. While the economic perspective implies that students take into consideration costs and future returns on college educations, the sociological perspective emphasizes the importance of background and change, during college, on student success or failure. Discussion of some sociological models, pertinent to persistence and educational attainment follows.

Tinto's (1987) theory of student departure suggested that student departure/persistence decisions are dependent on the level of academic and social integration that shape and modify future intentions and goals as the result of student

interactions with both formal and informal academic and social systems of higher education institutions. The essence of Tinto's interactionist theory is to view persistence and eventual graduation or withdrawal as both the combined and the end result of influences such as, student entry characteristics, the extent of integration and commitment to the institution, and commitment to goal. Braxton, Sullivan, and Johnson (2001) in their recent review of studies, which tested Tinto's propositions, reported the existence of moderate to strong empirical evidence that student entry characteristics affect the initial level of commitment to the goal of graduation, which, in turn, strongly influences the subsequent long-term commitment to the goal of graduation.

Although Tinto's model of student departure helps to understand how pre-college characteristics such as demographic, socioeconomic, and family background affect college experience, as well as the latter's crucial influence on persistence and graduation decisions, it does not clarify if institutional impact is different depending upon various characteristics that higher education institutions possess. Pascarella and his colleagues (Pascarella, 1984; 1985; Pascarella, Brier, Smart, & Herzog, 1987) have proposed some models that emphasize the importance of institutional environment in developing a student's educational aspiration.

According to Pascarella's change model, student's progression and development throughout college study, consequently their educational attainment, are subject to the influence of the direct effects of student effort, background characteristics, and the interactions with major agents of socialization which include institutional environment and characteristics (Pascarella, 1985). Pascarella (1984) also demonstrated that organizational structural characteristics such as selectivity, control, and enrollment can

greatly influence educational aspiration of college students beyond two years of study, the net of pre-college educational aspiration and a cumulative measure of college achievement. Further, Pascarella, Brier, Smart, and Herzog (1987) found that the college attended and the student's academic experience within that college have important direct and indirect influences on an individual's probability of becoming a physician, net of student's gender, ethnicity, social origins, and secondary school attainments. A recent study that also draws upon a college impact model similar to that of Tinto and Pascarella found that student persistence, up to the fourth year, was significantly and positively influenced by the institution's selectivity, size, and the extent to which it is residential, with constant student level variables (Titus, 2004).

Weidman (1989) proposed a model of undergraduate socialization, which helps to understand the importance of socialization in college attendance and graduation. Weidman posited that students enter college with certain aspirations, values, and aptitudes. While in a college, through interactions with faculty and peers, students gain exposure to the various normative pressures and socialization processes that are inherent to the context of the postsecondary institution. These normative pressures and socialization processes lead students to re-assess (change or maintain) their values, aspirations, and personal goals that were present at college entrance. Therefore, this socialization experience can influence college outcomes such as career choice, life style, and personal values and goals.

However, socialization processes and activities may promote or constrain a particular student's persistence and degree completion decisions, not only because the institutions present different social structures and opportunities, but also because students

with their differing pre-college characteristics can choose different patterns of socialization. Indeed, as Carter (1999) showed, degree expectations of White and African-American students differ significantly due to institutional characteristics and environments that provide particular socialization interactions and experiences.

Following from Weidman's model is that living in campus dormitories may positively influence degree completion due to increased level of social involvement and interactions that occur in residential facilities with the peers. Consistent with this view, Pascarella and Terenzini (2005) reported the existence of prior research evidence that demonstrates strong positive net effects of living on campus on persistence and completion of the bachelor's degree.

In all, these sociological and economic perspectives and previous empirical studies inform and permit drawing a conceptual framework for assessing the effects of financial aid on educational attainment (Figure 4-1). This framework considers postsecondary educational attainment as being affected by four sets of influences, namely: academic ability, institutional characteristics, financial aid, and students' socioeconomic and family background characteristics.

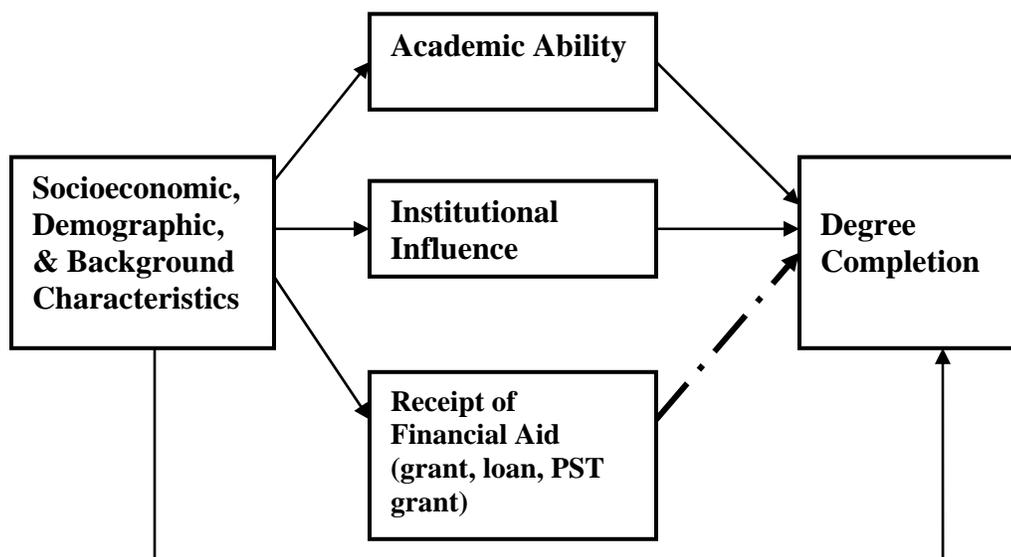


Figure 4-1: Conceptual framework for assessing the effects of financial aid on undergraduate degree completion.

In this model, drawing upon Tinto's theory of student departure (1987), the hypothesis is that students' demographic, socioeconomic, and family background characteristics affect college experience such as academic ability, college major, residence, and the receipt (or non-receipt) of financial aid, which, in turn, determine whether the student is successful in securing an undergraduate degree. However, consistent with Pascarella's (1985) model, pre-college background characteristics may also exert direct influence on the degree completion above and beyond student effort and institutional characteristics. Although background variables such as family income level and parents' occupations may determine if a student is eligible for financial aid, the conceptualization is that the receipt of financial aid will have a direct effect on degree completion above and beyond other influences.

Hypotheses and Expectations

In Mongolia, most bachelor's degree programs require four years of continuous study. Limited choice of elective courses, curriculum and program requirements, designed for a specific group of students enrolled in a program, provide little flexibility for a semester's delay or part-time enrollment. Transfer of students within and between institutions is also limited, because credits earned at one institution often are not transferable to another. Consequently, four years of study is a typical time span to determine a student's success.

As in some studies (DesJardins, Kim, & Rzonca, 2003; Ishitani, 2003; Cabrera, Burkum, & La Nasa, 2003), the dependent variable, degree completion, is dichotomous, indicating: 1= completed, and 0=not completed. Degree completion is defined as persistence or completion of bachelor's degree within four years. Because engineering and health programs may require five or more years, indication of persistence is through the fourth year, not necessarily the actual completion of degree.

In this study, four dummy variables that measure whether a student received or not any type aid and the receipt of grants, loans, or public employee's tuition grant verses no financial aid receipt during college study represent financial aid. As described in Chapter 2, grants, and loans are mostly need-based and grants for public employees' children can be considered merit-based due to their GPA requirement.

The receipt of financial aid is expected to associate with higher levels of persistence or degrees completion, although the magnitude of the effect may vary by type of aid (Hypothesis 1). Given the fact that per capita national income is little more than a dollar per day, the distinction between middle-income and poor is not noticeable. Despite

its modest amount in dollar terms, financial aid in this situation can be helpful, not only for poor students, but also for those from more or less middle-income families.

This positive association is anticipated, not only because financial aid does remove a major financial obstacle to college study, but also due to its built-in incentives to encourage its recipients to focus on their academic work and other intangible psychosocial benefits (Nora, Barlow, & Crisp, 2006; Taniguchi & Kaufman, 2005). Indeed, the case may be in Mongolia, that financial aid serves as an incentive for the entire family and encourages their children's commitment for continued study and degree completion.

The receipt of a need-based tuition grant should associate with higher effects on degree completion than loans or a public employee's tuition grant (Hypothesis 2). Research indicates that need-based grants are most effective for low-income students. Because this award is mostly for students with family incomes less than the minimum living standard or for herdsmen's families possessing livestock less than a specified amount, the net effect of the grant is likely to be the largest.

A public employee's tuition grant should positively influence degree completion (Hypothesis 3). However, the expected effect is lower than a need-based grant, but higher than the effect of a loan. This expectation arises from the following consideration: In Mongolia a public employee's tuition grant goes to an academically eligible student with a more educated parent, employed in public sector. Being more academically prepared and having more educated parents may indeed be an advantage in college. However, persistence and degree completion rates may be lower because public employees have more opportunity to look for better education for their children. In addition, a public

employee's tuition grant renewal is dependent on the evaluation of the recipient's performance in given semester, a factor that may lower its effect if a student is not maintaining study requirements.

Loans should positively influence persistence and degree completion, but the effect is weaker than grants (Hypothesis 4). Existing research suggests somewhat mixed effects of loans on degree completion. While loans are beneficial to middle-income students, they do not exert a positive effect on degree completion for students whose parents have low or high incomes (Kim, 2003). The explanation for this lesser effect of loans is often loan aversion or aversion to the higher costs of repayment of accumulated debt. Since government loan programs in Mongolia offer a limited amount with very favorable conditions that make the loans similar to grants, the anticipated effect is positive and comparable to the grant effect.

College grade point average (GPA) measures academic ability on a four-point scale at the time of degree completion or drop out. As numerous studies have demonstrated, academic ability or achievement is the single most important predictor of a student's completion of college-level study (Pascarella & Terenzini, 2005; Heller, 2003; Cabrera, Burkum, & La Nasa, 2003). Therefore, this study expects to find a positive effect of academic ability on the outcome variable. However, a question worth investigating is whether or not academic ability influences degree completion independently, without financial considerations. High achievers do not necessarily come from relatively wealthy families and sufficient academic ability may not guarantee degree completion if students need to obtain tuition and living expenses.

As research suggested, institutional characteristics such as quality, size, type, and control may influence a student's chances of completing a college degree (Pascarella, Brier, Smart, & Herzog, 1987; Titus, 2004; Carter, 1999; Murdock, 1987). In Mongolia, studying in a small private college may provide a different experience than studying in a prestigious public university. Private colleges may not only provide a better opportunity for interacting with faculty and peers, but also a less challenging curriculum, thus, facilitating a greater rate of degree attainment. However, this study expects institutional influence to be minimal, because the six institutions covered are all public and similar in prestige and tuition. Nevertheless, the study uses a dummy variable for each institution to account for size and other differences among the institutions.

Dichotomous variable (1= selected, and 0= not selected) measures fields of study such as Education, Humanities, Business, Science, Engineering, and Agriculture. The field of study or academic major can also influence degree completion on the basis that some fields yield a higher rate of return than others in terms of after-college employment earnings. For example, St. John, Hu, Simmons, Carter, & Weber (2004) demonstrated significant influence from majors in Health, Business, Engineering, and Computer Science on persistence among African-American students. In Mongolia, Business, Law, Engineering, and Service (Hotel and Tourism) majors are the most attractive to students, and thus, may influence greater degree completion.

Another important feature of the college experience is the level of social integration or socialization that ties students to college in which they enrolled. More involved and socially active students may persist longer and eventually graduate, because of enhanced changes in their values, aspirations, and goals that result from the

interactions with faculty, peers, and other agents of socialization (Weidman, 1989). A limitation of this study is the lack of a direct measure for either the level socialization, or the educational aspirations of the students. This study uses a dummy variable for residential status, operationalized as the place where students mostly lived during their college years (1= lived in dormitory, and 0=off-campus), as a proxy for social involvement. Socialization experience of those living on-campus may be different from those who live off-campus. However, in Mongolia, living in college dormitories provides much a cheaper alternative than renting a room or an apartment (Altantsetseg, 2002). Therefore, a higher rate of degree completion is the expectation for those who live in a dormitory.

In Mongolia, as elsewhere, students bring to college a variety of pre-college experiences, expectations, and characteristics. The demographic variables included in this study are student's gender, age, and family status. Currently, a predominant proportion of college students in Mongolia are female. Perhaps, this is not because girls are more intelligent than boys, rather because of the higher dropout rate for boys in primary and secondary schools (partly related to the fact that herdsman's families need boys' assistance in herding the livestock). Mongolian parents usually place higher priority on girls' education than boys', thinking that boys can make their living by doing any kind of "manual work." In this sense, parents' encouragement and expectations for higher levels of educational attainment may positively influence girls' commitments to the goal of graduation. Therefore, this study expects to find higher probability of degree completion for females than for males.

Age is a calculation based on institutional reports of students' birthdates. Older students may not be as successful as their younger peers, because, at least partially, college level curriculum includes higher math and science courses for which high school preparation without an interruption is essential for success. However, as Jacobs and King (2002) demonstrated, the negative relationship between age and degree completion is largely explained by the part-time enrollment of older students. Since, this study includes no part-time enrollees, the net effect of age (either positive or negative) is likely to be minimal.

In contrast, family status (independent=1, and dependent=0) may be a facilitator of better persistence and degree completion. Compared to dependent students who basically rely on parental support and resources (that may not be always available for those separated from parents for college study), more mature, experienced, and financially independent students may be in better positions to deal with the problems associated with college education. Married students may focus more on studying, thanks to increased support from their spouses (Taniguchi & Kaufman, 2005; Jacobs & King, 2002).

Family background variables are family income level, parental occupation, and family size. In this study, family consumption level (high, average, and low) relative to minimum living standards is the proxy for family income. Annually updated, official, minimum living standards serve as major criterion for students' eligibility for need-based grants and loans. Thus, institutions are able to report the level of family consumption, not the direct measure of family income expressed in togrog, the national currency of Mongolia. Low- or average-level family consumption indicates that students may bear

the burden of college costs. Because family income or socioeconomic status is an important determinant of persistence and degree completion, students from a small, but emerging group of rich families may be more successful in college and graduate at higher rates than other groups. However, the case may be that more affluent families are able to send their offspring to an overseas university or at least to a Mongolian based branch of a foreign university. Therefore, the expectation is that this variable has little effect.

Parental educational level often predicts the level of children's educational attainment, because more educated parents inspire and support their children toward higher levels of educational attainment. Perhaps, this relationship is also the expectation in Mongolia. Unfortunately, the existing data do not contain this important information. In the current economic context of Mongolia, parental employment may be more advantageous to students than having more educated but unemployed parents. Parental occupation, operationalized as the principal sector of employment of the head-of-family, is measured through three dichotomous variables (1= private sector, public sector, self-employed, or retired, and 0=unemployed). Working parents may be able to provide necessary financial and other support to their college age children. Private sector wages and salaries are higher than that of similar positions in the public sector. Public employees are usually more educated than private sector employees, because teachers, doctors, and those employed in government offices traditionally form the so called *intelligencia*. Therefore, students with parents employed in both private and public sectors will likely have a better chance of completing a college degree.

Family size may be an important variable to consider in the context of Mongolia. As of 2004, 7.7% of families had four or more children under the age of 16 (NSO,

2005b). Rural families are usually larger than urban households. Families with many children going to school certainly will need more financial resources. Recognizing the challenges faced by large families, the need-based grant program is directed towards sponsoring free tuition for one of three children attending college at the same time. Although being from a large family may adversely affect student's persistence and degree completion due to inadequate support from the family, having college educated siblings may facilitate student's success in college. In view of these contradictory influences, family size is likely to have a minimal effect on degree completion.

While the majority of college students come from the city or provincial centers, some students come from herdsmen' families, and graduate from remote rural schools where the quality of education is largely dependent on the teachers. Pre-college experiences and preparation for college of these students is different and worth investigating. However, ongoing migration of the population from rural areas to urban centers makes determining the real size of the rural population difficult. In this study, high school location, (which may indicate not only rural/urban distinction but also the quality of the high school) is expressed through two dummy variables: 1=provincial center; 0=otherwise, and 1= county; 0=otherwise; reference group is city.

Another variable that also may reflect rural/urban difference is the distance between high school and college. While institutions, covered in the present study, are in the capital city, students come from almost every province and county. Although Perna's (1998) study suggested that distance from home as a measure of student involvement may positively affect bachelor's degree completion, for this study the reverse relationship

may hold true: those from remote provinces or counties may experience additional difficulties traveling home or getting support from families.

High school graduates in Mongolia usually continue their education in college right after they finish secondary schooling. No obvious reason exists to delay college education unless applicants are not successful in entrance exams. College entrance exam scores often serve as the sole criterion for admission decisions. On the other hand, entrance exam scores may indicate the real level of academic resources and preparedness for college study, thus, in turn, affect degree completion (Adelman, 1999). A positive effect from entrance exam scores is anticipated. High school grades (measured in a 5-point scale) are also expected to positively influence students' chances of degree completion. This expectation arises from evidence that suggests a positive direct or indirect effect of grades and other high school variables on degree completion (see, for example, Zwick & Sklar, 2005; Hoffman & Lowitzki, 2005; and Trusty & Niles, 2004).

Data Source and Transformations

This study examines the relationship between financial aid and degree completion and whether different types of financial aid (loans, grants, and public employee's tuition grant) have varying effects on facilitating students' progress toward completion of a bachelor's degree in Mongolia. With few exceptions, most of the reviewed (see Chapter 3) studies used data obtained from national surveys of representative samples of students. Although survey research is, apparently, cost efficient, valuable, and a reliable tool for detecting possible relationships in the sample and inferring those relationships to the

population, implementing survey instruments often associates with the problems of sampling, non-response, and reliability and validity of instruments (Fowler, 2002). To avoid some problems of survey research, particularly those related to self-reporting bias, this study focuses on the population of a specific cohort of students at particular institutions and relies on existing data, instead of data collected through a survey. Among surveyed students, self-reporting bias may compromise the accuracy of information such as high school achievement, college GPA and family income, especially in a Mongolian context where people are reluctant to reveal low achievement or real income. And documented verification is virtually impossible.

The target population of this study is a cohort of bachelor's degree seeking students enrolled in the 2000-01 academic year at six public institutions in Mongolia¹⁰. These institutions are Science & Technical University, Agricultural University, University of Education, Medical University, Institute of Commerce & Business (ICB), and Institute of Finance and Economics (IFE)¹¹, all located in the capital city of Ulaanbaatar.

Responding to an appeal, the ministry issued an official letter to the institutions requesting the necessary data for the study as of Fall 2005. According to a provided template (see Appendix A), the institutions integrated individual student's admission, financial aid, background, and progress data without any identifying information, In

¹⁰ Initial proposal covered three major universities. However, in order to derive more variety in students' fields of study and also follow the Ministry of Education, Culture, and Science's request to expand the scope of the research, an additional three institutions have been asked to provide the data.

¹¹ Institute of Finance and Economics is a non-governmental or private college established as the result of management privatization, although it was still considered public in 2000.

addition to existing data, university-level student affairs staff members were asked to indicate family income levels relative to minimum living standards. Compiled into an Excel Worksheet, data were received through email.

Although students studying at private institutions do receive financial aid, their proportion relative to total enrollment is quite small. By 2000, few private institutions had accreditation, hence lacked eligibility for their students to receive financial aid. Therefore, private institutions were excluded from this study. Selection of the above six institutions was on the basis that they represent in aggregate variety of disciplines, are all well established, and experience similar status recognition. Four universities branched from the National University of Mongolia at different times prior to transition. Two business colleges, the oldest professional schools in Mongolia, upgraded to colleges in 1991.

The data were translated into English, recoded, and converted into an SPSS file. However, several rounds of communication with some institutions became necessary to make sure that the data were accurate and more or less complete. Besides translation, the following transformation prepared the data for the analyses:

1. The institutions indicated the name of the program or major in which students studied. These majors grouped into the fields of study using UNESCO's International Standard Classification of Education (UNESCO, 1997).
2. Since the implementation of the credit hour system in 1998, the institutions were allowed to use the grading system that most suits them. As a result, the college GPA data were indicated as percentage points for Medical

University and business colleges, and four-point scores for the other institutions.

These grades all were converted to a four-point scale.

3. Entrance exam scores also differed substantially by institutions because some institutions have two entrance exams, while others require three or more. To create comparability, these scores, separately for each institution, have been converted into Z-scores.

4. A variable indicating the distance between Ulaanbaatar (the institutions' location) and students' provinces/counties was created using the names and the road network published by the Ministry of Infrastructure (2000).

Analytic Procedures

The two types of analyses conducted are: First is a descriptive analysis, including computation of the rate of bachelor's degree completion by institution, family consumption level, parental occupation, and high school location for students who received financial aid and those who did not receive any financial aid. Degree completion rates for the recipients of grants, loans, and public employee tuition grants are also computed and compared with the non-recipient degree completion rate. These comparisons provide an indication of the overall effect of financial aid on degree completion.

Second is a multivariate logistic regression analysis, conducted to assess the relationship of students' backgrounds, academic abilities, institutional and financial aid variables to degree completion. Not only the dependent variable (degree completion) but

also many of the independent variables in this study are measured as dichotomous or categorical variables. Therefore a logistic regression analysis of the probability of bachelor's degree completion for aid recipient verses non-recipient and the effect of different types of financial aid on degree completion is appropriate. Choosing logistic regression is not only due to the dependent variable's dichotomous nature, but also due to the expected skewed or unequal distribution of graduates on financial aid and other individual variables. Student background, academic ability, institutional and financial aid variables were entered into logistic regression sequentially, forming three blocks: The first block includes each student's pre-college characteristics such as gender, age, family income, size, status, parental occupation, high school grades, and the place of high school graduation. College experience variables such as GPA, field of study, institution, entrance exam score and residential status, and also distance between high school and college form the second block. The third block consists of only financial aid variables. Choosing the block entry (or forced entry) method of placing variables into the regression model is due to its consistency with the conceptual framework. Statisticians recommend using the forced entry method for theory testing or predictive by nature analysis (Menard, 2002; Studenmund & Cassidy, 1987).

Although ordinary least square regression can also apply to the situation with dichotomous dependent variables, logistic regression has the advantage of minimizing errors of prediction (Menard, 2002). In a logistic regression model, a dichotomous dependent variable transforms as the logarithm of the odds of the occurrence of a particular outcome (in this case, completion or not of bachelor's degree within four years).

Mathematically, the logistic regression model takes the form of Equation 4.1:

$$\ln\left[\frac{P_i}{(1-P_i)}\right] = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + \varepsilon, \quad \text{Equation 4.7}$$

where P_i , in this study, is the probability that student, i , completes the bachelor's degree; $1 - P_i$ is the probability that student, i , will not complete the degree; X_1 is financial aid variables; X_2 is academic ability; X_3 is institutional level variables, and X_4 is the variables that represent pre-college characteristics. b_0 is the intercept; b_1, b_2, b_3, b_4 are the estimated coefficients of each of the independent variables included in the model, and ε is the error term.

P_i is expressed in Equation 4.2 as:

$$P_i = \frac{e^{bX}}{(1 + e^{bX})} \quad \text{or} \quad P_i = \frac{1}{(1 + e^{-bX})}. \quad \text{Equation 4.8}$$

A problem with logistic regression is that the interpretation of the regression coefficients is not straightforward as it would be in linear regression models. Therefore, initial beta coefficients are converted into change in probability measures, or delta- p statistics as suggested by Peterson (1984) in Equation 4.3:

$$\Delta P = \frac{e^{L_1}}{(1 + e^{L_1})} - \frac{e^{L_0}}{(1 + e^{L_0})} . \quad \text{Equation 4.9}$$

where L_0 = logit before the unit change in X_i , i.e., $L_0 = \ln [P / (1 - P)]$; L_1 = logit after the unit change in X_i , and $L_1 = L_0 + b$, where b is the logistic regression coefficient.

The participating institutions were asked to provide data on all full-time undergraduate students. Data received from the institutions consisted of 5007 cases or approximately 25% of the total undergraduate population of public higher education in the 2000-01 academic year. Before proceeding with the analyses, several statistical procedures were applied to assess the appropriateness of the data for analyses and make necessary adjustments, if needed. These procedures include goodness of fit test, missing value analysis, data imputation, multi-collinearity diagnosis, and data fit assessment.

List-wise elimination of cases with missing values resulted in a sample of 4398 cases. To see if the sample is different from the target population, Chi-Square test is conducted for the variables gender, age, rural/urban origin, and field of study. The results of these tests appear in Table 4-1. The goodness of fit test results did not support the assumption that the sample is different than the target population, at least by each student's gender, age, and high school location. However, the sample significantly differed from the population by field of study. The sample over-represents business, science, and agricultural studies and under-represents education, humanities, engineering, and other fields of study. This difference is partially due to the fact that data from the

institutions offering the latter fields of study are incomplete, particularly in students' GPA, entrance exam scores, and high school performances. In this situation, appropriate action is to use a data imputation technique, which allows inclusion of as many cases as possible in order to lessen the difference between sample and population.

A missing value analysis showed that the values of three variables, high school grades, entrance exam scores, and college grade point averages, were missing in more than five percent (6.4%, 8.3%, and 6.1%, respectively) of the cases, while a few family related variables were absent in less than five percent. Correlational imputation of missing values in the SPSS MVA feature was conducted using only predictors significantly correlated to the missing variable.

Table 4-1: Goodness of Fit Test between Population and Sample

Variables	Groups	Observed n	Expected n	Chi-Square Value	Degree of Freedom
Gender	Female	2758	2749	.08	1
	Male	1640	1649		
Age	<21	146	146	.48	2
	21-24	3674	3690		
	25 and older	578	562		
Rural/Urban	Urban	3716	3708	.03	1
	Rural	682	690		
Field of study	Education	369	441	33.06*	6
	Humanities	493	498		
	Business	925	850		
	Science	731	669		
	Agriculture	397	369		
	Engineering	1322	1382		
	Other	161	189		

* Significant at 0.05

In the case of high school grades, predictors were age, gender, family income, parent's occupation, family size, field of study, degree completion, financial aid, and college GPA. In addition to the above set of variables, high school grades, residence in college, and distances are also significantly correlated to the entrance exam score. For the college GPA, entrance exam scores are added, excluding, of course, GPA scores themselves and family consumption levels.

Another concern relates to the variables of primary interest in this study, degree completion and financial aid. If the rate of degree completion and rate of financial aid award varied significantly by institution, control for this difference is necessary to prevent compromised results of multivariate analysis.

Table 4-2 shows degree completion and financial aid award rates by institution. Considerable differences among institutions in degree completion and financial aid award rates justify using a dummy-coded variable for institutions to account for these differences.

Table 4-2: Degree Completion and Financial Aid Award Rates by Institution, %

Institutions	Degree completion		Financial aid	
	%	% in total	%	% in total
Science & Technical University	62.2	36.4	41.3	36.2
Agricultural University	63.5	23.7	46.9	23.7
University of Education	78.0	22.5	47.3	22.6
Institute of Commerce & Business	80.4	7.3	47.7	7.4
Institute of Finance & Economics	86.3	2.9	50.0	2.9
Medical University	81.8	7.1	63.1	7.2

As with any regression analysis, logistic regression analyses are not exempt from biases. Essential for the validity of the model and the generalizability of the findings is assessing how “good” or the “bad” the model is in terms of fitting the data.

One of important assumptions of the regression analysis is that, in the model, no perfect linear relationship between two or more of predictors should be present. When multicollinearity is in place, it limits the proportion of variance explained by the predictors; regression coefficients are unstable, and difficulty arises for knowing the relative importance of predictor variables (Field, 2000, p.128).

Table 4-3 shows bivariate correlation coefficients for predictor variables highly correlated with each other. These results show the existence of a near perfect correlational relationship between the receipt of financial aid and years of financial aid. Therefore, in the analysis, years of financial aid received is eliminated because it is not a primary variable of interest, and keeping it may compromise the results. This measure is justified since the research questions concern the receipt of financial aid, not years of receiving aid. Indeed, a model that includes years together with financial aid or its types showed significant but negative coefficients for financial aid variables.

Table 4-3: Bivariate Correlation Coefficients for Selected Predictor Variables

Variables	Variables	Correlation Coefficient	P –value
Years financial aid received	Receipt of financial Aid	0.954	<0.001
Receipt of financial Aid	Tuition grant	0.552	<0.001
	Loan	0.351	<0.001
	PST grant	0.451	<0.001
High school Location	Rural/urban origin	0.767	<0.001
Parent’s occupation -public	Receipt of PST Grant	0.596	<0.001

Although a moderate correlation between parental occupation and the receipt of public employees' tuition grant was the expectation due to the nature of a grant limited to only public employees' children, this relationship is not perfect to be able to affect subsequent analyses. The financial aid variable indicates the receipt of any type of financial aid. Thus, as expected, it correlates moderately with the receipt of grants, loans, or public employees' tuition grants. However, to avoid any possible collinearity effect, the two analyses are conducted separately, one involving only financial aid and other - including the types of financial aid without their aggregative versions.

In the same way, as financial aid is a composite of three types of financial aid, the location of high schools (city, province, and county) reflects and highly correlates with rural/urban (province plus county v. city) origin of the students. Still debatable is what constitutes "rural" in Mongolia: only county residents or county and province together? The secondary school restructuring project implemented in 1997-2000 led to the closure of many county (soum) high schools (ADB, 2003) resulting in the transfer of students from county to provincial centers. Taking into consideration this development makes omitting the rural/urban origin viable.

After making the preceding adjustments, testing for multicollinearity is conducted using the SPSS collinearity diagnostic feature in linear regression analysis (see Table 4-4). Menard (1995) suggested that a tolerance value of less than 0.1 almost certainly indicates the existence of a serious collinearity problem. Since no tolerance value less or close to 0.1 appears, further investigation of collinearity by examining the Eigen values

of the scaled, uncentred cross-product matrix, condition indexes, and variance proportions is deemed unnecessary (Field, 2000).

The overall fit of the model can be assessed using several statistics. Nagelkerke R-Square shows that the model explained approximately 58% of the variance in degree completion. Although it has a tendency to overestimate the proportion of explained variances, Nagelkerke R-square is preferred over other measures such as Cox and Snell R-Square and Hosmer and Lemeshow's R-square, because Nagelkerke R-square ranges, as R-square in OLS regression, from 0 to 1. The model correctly classifies 93.8% of cases of those who completed bachelor's degrees and 65.6% of those who did not. Thus, overall accuracy of classification (weighted average of above two) is 86.2%. Besides, Chi-Square values of the model, block, and step are all statistically significant indicating substantial improvement in the predictive power of the model from one step to another.

Table 4-4: Collinearity Statistics for the Sample

Variables	Tolerance	Variance Inflation Factor (VIF)
Gender male	0.897	1.115
Age (in 2004)	0.723	1.383
Graduated high school in – Province	0.443	2.256
Graduated high school in – County	0.500	1.998
High school grade	0.665	1.505
Family status - Dependent	0.701	1.427
Family income level – High	0.557	1.795
Family income level - Average	0.541	1.848
Parents' occupation – Private sector	0.482	2.073
Parents' occupation – Public sector	0.408	2.451
Self-employed or retired	0.608	1.644
Family size	0.847	1.180
Field of study- Education	0.310	3.229
Field of study- Humanities	0.346	2.888
Field of study- Business	0.388	2.576
Field of study- Science	0.371	2.694
Field of study- Agriculture	0.527	1.899
Field of study- Other (service)	0.727	1.376
College entrance exam score	0.871	1.148
Lived in dormitory	0.849	1.178
Distance between high school and college	0.496	2.008
College grade point average	0.709	1.410
Attended institution - Science & Technical University	0.320	3.126
Attended institution - University of Education	0.165	6.047
Attended institution - Institute of Commerce & Business	0.519	1.927
Attended institution - Institute of Economics & Finance	0.665	1.504
Attended institution - Medical University	0.330	3.026
Received financial aid –Grant	0.670	1.493
Received financial aid –Loan	0.849	1.177
Received financial aid –PST Grant	0.586	1.706

As part of assessing goodness of fit and/or to determine the points of poor fit, an inspection of residuals is necessary. Studentized residuals (ZRE), standard residuals (SRE), and deviance statistics (DEV) are examined using “select cases” and “case summaries” procedures. Field (2000, p. 188) recommended that the values of these created variables should lie within ± 2.5 , and any case with values outside this range should be inspected more closely. Thirteen cases with values of ZRE, SRE, or DEV

greater than 2.5 have been detected. These cases occur when institutions report successful degree completion for students with low GPA, who did not receive any financial aid.

Far more cases (total of 110, but less than three percent of the sample) with a value of one for the aforementioned three variables less than -2.5 reflect the situation of students reportedly leaving the college after two or three years of study despite the fact that they had a very high GPA, and many of them received financial aid. Although various reasons for leaving college exist, perhaps, most of these high achievers departed to continue their studies abroad¹².

Leverage statistics, and DFBeta values for variables are within the range recommended by statisticians indicating that the model is not affected by certain influential cases (see, Field, 2000; Hosmer & Lemeshow, 2000). In short, this assessment suggests that the model is viable and it adequately fitted to the data.

¹² Because Mongolia's primary and secondary education until recently provided only ten years of general education, students were required to complete at least two years of college study at their respective institutions to become eligible to study in some foreign countries. For example, Japan, which offers a substantial number of undergraduate scholarships for Mongolian students, receives applications only from college juniors who successfully pass special exams. In addition, each year STF sponsors several hundred students' studies abroad; these may be at undergraduate as well as at graduate levels.

Chapter 5

FINDINGS

Descriptive Analyses

Table 5-1 provides descriptive statistics for the sample. The sample has the same proportion of females as the general, higher education, student population. An average student in the sample is an unmarried female, from a family of five, residing in a provincial center, located approximately 230 miles from the capital city. This student performed quite well (grade of 4.16) in high school, scored 22 points in the entrance exams, did not receive financial aid, and completed a bachelor's degree (or persisted through a fourth year) in Engineering ending with a C grade at age of 22. Seventy three percent of the sample completed undergraduate degrees within four years. In total, 48% of the students received financial aid while studying at college. Need-based tuition grants were awarded to 22%, while public employee's tuition grant and loan awardees equal, respectively, 16 and 10% of the total cases.

Table 5-1: Descriptive Statistics for the Sample

Variable	Group	N	%	Range	Mean	Std. Deviation																																																																																																																																																														
Gender	Male	1640	37.3	NA	NA	NA																																																																																																																																																														
	Female	2758	62.7				Age		4398	100	18-45	22.6	.04	Distance		4398	100	0-1838	366.6	6.98	High school performance		4398	100	2-5	4.16	.48	Entrance exam score (z-score)		4398	100	-2.83 to 9.62	0.0	.99	Family size		4398	100	1-19	5.25	1.57	Family income	High	375	8.5	NA	NA	NA	Average	2688	61.1	Low	1335	30.4	Parents' occupation	Public	1022	23.2	NA	NA	NA	Private	1389	31.6	Less- Employed	973	22.1	Unemployed	1014	23.1	Financial aid type	Need grant	968	22.0	NA	NA	NA	PST-grant	697	15.8	Loan	451	10.3	Financial aid	Received	2115	48.1	NA	NA	NA	Did not receive	2282	51.9	Grade point average		4398	100	0.8-4.0	2.69	.01	Degree completion	Completed	3206	73	NA	NA	NA	Not completed	1192	27	Field of study	Education	369	8.4	NA	NA	NA	Humanities	493	11.2	Business	925	21.0	Science	731	16.6	Agriculture	397	9.0	Engineering	1322	30.1	Other	161	3.7	Family status	Dependent	4000	91.0	NA	NA	NA	Independent	398	9.0	Graduated high school in	City	1942	44.2	NA	NA	NA	Province	1774	40.3	County	692	15.5	Lived in dormitory	Dormitory	1037	23.6	NA	NA
Age		4398	100	18-45	22.6	.04																																																																																																																																																														
Distance		4398	100	0-1838	366.6	6.98																																																																																																																																																														
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Family income	High	375	8.5	NA	NA	NA																																																																																																																																																														
	Average	2688	61.1																																																																																																																																																																	
	Low	1335	30.4																																																																																																																																																																	
Parents' occupation	Public	1022	23.2	NA	NA	NA																																																																																																																																																														
	Private	1389	31.6																																																																																																																																																																	
	Less- Employed	973	22.1																																																																																																																																																																	
	Unemployed	1014	23.1																																																																																																																																																																	
Financial aid type	Need grant	968	22.0	NA	NA	NA																																																																																																																																																														
	PST-grant	697	15.8																																																																																																																																																																	
	Loan	451	10.3																																																																																																																																																																	
Financial aid	Received	2115	48.1	NA	NA	NA																																																																																																																																																														
	Did not receive	2282	51.9																																																																																																																																																																	
Grade point average		4398	100	0.8-4.0	2.69	.01																																																																																																																																																														
Degree completion	Completed	3206	73	NA	NA	NA																																																																																																																																																														
	Not completed	1192	27																																																																																																																																																																	
Field of study	Education	369	8.4	NA	NA	NA																																																																																																																																																														
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	Agriculture	397	9.0																																																																																																																																																																	
	Engineering	1322	30.1																																																																																																																																																																	
	Other	161	3.7																																																																																																																																																																	
Family status	Dependent	4000	91.0	NA	NA	NA																																																																																																																																																														
	Independent	398	9.0																																																																																																																																																																	
Graduated high school in	City	1942	44.2	NA	NA	NA																																																																																																																																																														
	Province	1774	40.3																																																																																																																																																																	
	County	692	15.5																																																																																																																																																																	
Lived in dormitory	Dormitory	1037	23.6	NA	NA	NA																																																																																																																																																														
	Off-campus	3361	76.4																																																																																																																																																																	

Note: NA- not applicable. Mean, standard deviation, and range are not applicable to dichotomous variables.

While only less than nine percent of the students are from families with high income levels, 91% of cases reported family incomes of around or less than the minimum living standard (average- 61%, low-30%). In terms of parental occupations, the sample distribution is: largest group, students with parents employed in the private sector (32%) and the remaining students equally belong to three parental occupation groups, such as public, less-employed (or retired), and unemployed. The overwhelming majority (91%) of students still live with (or were dependent on) their families. Independent students are reported in nine percent of the cases. Twenty four percent of students live in dormitories while studying at a college. Most of students graduated high school either in a city (44%) or a provincial center (40%) with only 16% of students coming from rural counties.

Since the main focus of the descriptive analysis is to determine degree completion rates for student groups with differing characteristics, several cross-tabulations have been performed. The results of these comparisons are illustrated graphically.

The first tabulation is for degree completion rates of aid-recipients and non-recipients by institution (see Figure 5-1). A trend across the institutions is that degree completion rates are higher for aid recipients than for non-recipients. The largest differences are in the Agricultural University and the Science & Technical University (19 and 17%, respectively), followed by the Education University (16%). For the ICB and the Medical University, this is similar, around 13%. However, virtually no difference occurs in degree completion rates of aid recipients and non-recipients at IFE.

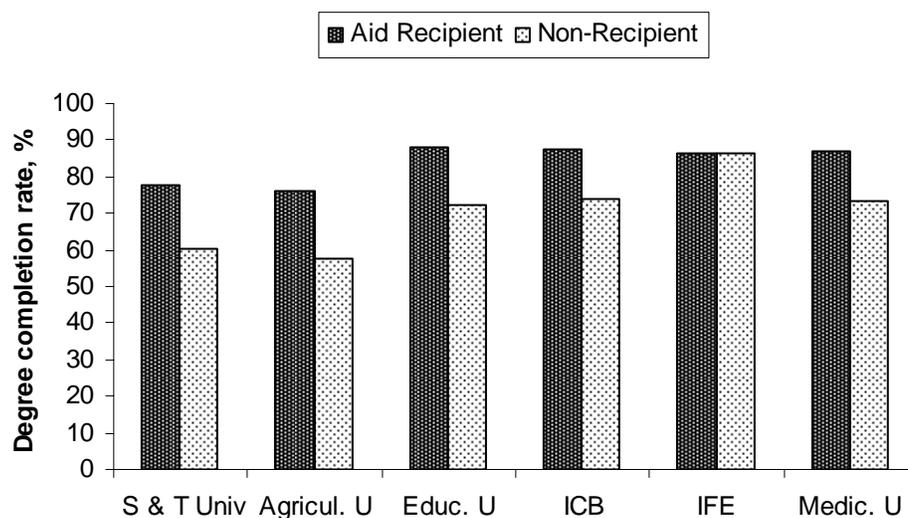


Figure 5-1: Degree completion rates by institution for aid recipients and non-recipients.

Figure 5-2 illustrates degree completion rates for aid-recipients and non-recipients by family consumption level. Degree completion rates are higher for aid-recipients than for those who did not receive financial aid, regardless of family consumption level. However, the difference in degree completion between aid recipients and non-recipients is the largest (36%) for low-income, and smallest (9%) for the high-income group with average income level being somewhere in between the two (12%).

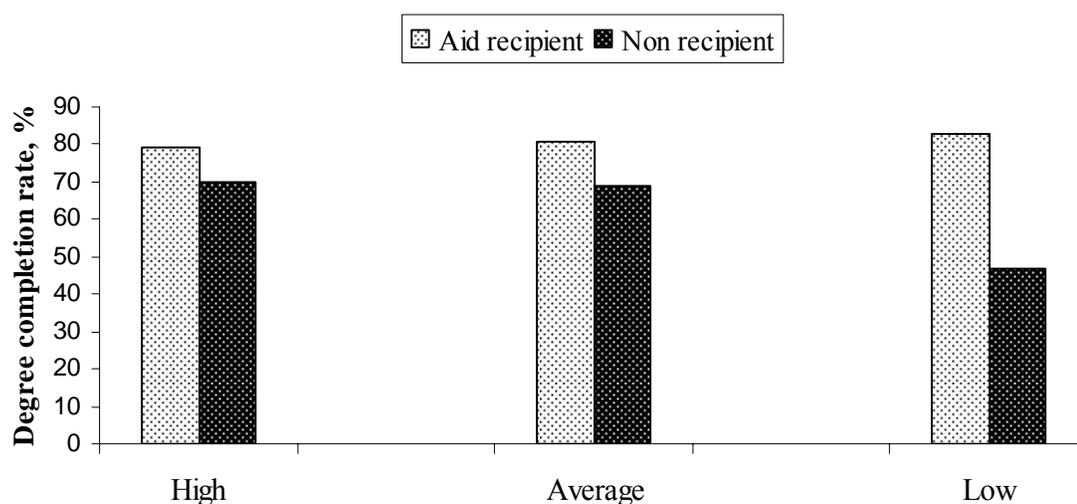


Figure 5-2: Degree completion rates by family consumption level.

When considering parents' occupations, again, aid recipients are completing their study at higher rates than non-recipients (Figure 5-3). However, data suggest that the advantage of receiving financial aid is greater for those whose parents are unemployed or have less opportunity for full-time employment.

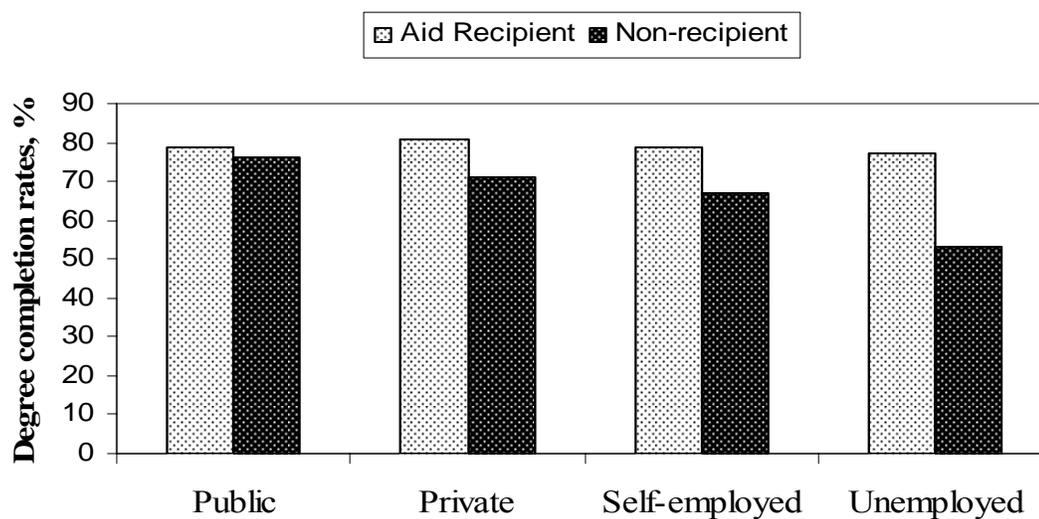


Figure 5-3: Degree completion rates by parents' occupations.

Table 5-2 shows degree completion rates for aid recipients and those who did not receive financial aid by graduated students' high school locations. Data indicates that receiving financial aid is beneficial to all students regardless of a family's residential origin. For students who did not receive financial aid, observed degree completion rates are highest (68%) for those who graduated high school in provincial centers and lowest for capital city graduates (63%) with those coming from rural counties in between (66%). When students receive financial aid, they are likely to complete their undergraduate study at a similar high rate of 81-82%, regardless of where they graduated high school.

Table 5-2: Degree Completion Rates by Location of High School

Location of High School	No Aid	Received Financial Aid	Difference %
Capital city	62.7	82.2	19.5
Provincial centers	67.6	81.0	13.4
County	65.9	82.4	16.5

Table 5-3 displays the observed degree completion rates by type of financial aid. The recipients of need-based grants, public employees' tuition grants, and loans are completing their undergraduate study alike at the rate of 82%, as compared to 65% completion rate of those who did not receive financial aid. As mentioned earlier, these types of financial aid are mutually exclusive. The proportion of students who did not complete a college degree among non-recipients is approximately twice the proportion of non-completers who received financial aid. No difference in completion rates for grant, public employee's tuition grant, and loan recipients is observed.

Table 5-3: Degree Completion Rates by Type of Financial Aid

Types of Financial aid	Not completed %	Completed %	Difference
Any type of financial aid	18.3	81.7	63.4
Need-based Grant	18.9	81.7	62.8
Public Servants' Tuition Grant	17.6	82.4	64.8
Loan	18.2	81.8	63.6
No Financial Aid	35.2	64.8	29.6

In summary, descriptive analyses suggest that aid recipients are more likely than non-recipients to persist and attain their undergraduate degrees, and financial aid is more beneficial to students from the capital city, from families with low consumption, or with unemployed parents, than are their relevant peers. These results are promising since they indicate that in the sample, relationships may be in the hypothesized direction. However, based on these results no definite conclusions can be drawn because, alternate influences on the dependent variable, degree completion, have not been considered. The next section provides the results of multivariate logistic regression analyses, which addresses this insufficiency.

Multivariate Analyses

As already mentioned, three blocks have been formed. The first block included each students' pre-college characteristics such as gender, age, family income, size, status, parental occupation, high school grades, and their place of graduation from high school. College experience variables such as GPA, field of study, institution, entrance exam score and residential status, and also distance between high school and college form the second block. The third block consists of only financial aid variables.

Background and College Experience Factors

Although the relationship between financial aid and undergraduate degree completion is of primary interest, the study reveals some interesting findings in terms of both background and college experience factors affecting degree completion (see Table 5-4).

Table 5-4: Relationship between Financial Aid and Degree Completion

Variables	Sample Model 1		Sample Model 2		Sample Model 3		Imputed Data	
	Coefficients (standard errors)	Delta P	Coefficients (standard errors)	Delta P	Coefficients (standard errors)	Delta P	Coefficients (standard errors)	Delta P
	1	3	4	5	6	7	8	9
Gender male (female -reference)	-0.717 (0.07)	-0.1613***	-0.256 (0.10)	-0.0534**	-0.252 (0.10)	-0.0525**	-0.168 (0.09)	-0.0366
Age (in 2004)	0.022 (0.02)	0.0043	0.009 (0.02)	-0.0018	0.002 (0.20)	0.0005	0.009 (0.02)	0.0019
Graduated high school in (city-reference)								
Province	0.274 (0.08)	0.0506***	0.105 (0.14)	0.0202	0.003 (0.14)	0.0006	-0.116 (0.13)	-0.0250
County	0.258 (0.11)	0.0479*	0.248 (0.18)	0.0461	0.172 (0.19)	0.0325	0.078 (0.17)	0.0162
High school grade	0.848 (0.08)	0.1337***	0.078 (0.12)	0.0151	0.089 (0.12)	0.0172	0.104 (0.11)	0.0213
Family status: dependent (independent-reference)	-0.572 (0.15)	-0.1261***	-0.311 (0.19)	-0.0656	-0.339 (0.19)	-0.0718	-0.455 (0.19)	-0.1032*
Family income level relative to minimum living standard (low-reference)								
High	-0.219 (0.15)	-0.0454	-0.367 (0.21)	-0.0782	-0.060 (0.21)	-0.0119	0.063 (0.20)	0.0130
Average	-0.112 (0.09)	-0.0227	-0.001 (0.12)	0.0002	0.208 (0.13)	0.0391	0.243 (0.12)	0.0485*
Parents' occupation (unemployed – reference)								
Private sector	0.480 (0.10)	0.0840***	0.306 (0.14)	0.0561*	0.327 (0.14)	0.0597*	0.323 (0.13)	0.0633**
Public sector	0.966 (0.12)	0.1471***	0.645 (0.16)	0.1078***	0.404 (0.16)	0.0721**	0.328 (0.15)	0.0738**
Self-employed or retired	0.444 (0.10)	0.0785***	0.317 (0.14)	0.0579*	0.320 (0.14)	0.0584*	0.424 (0.13)	0.0810***
Family size	0.063 (0.02)	0.0123**	0.029 (0.03)	0.0057	0.029 (0.03)	0.0056	0.026 (0.03)	0.0055

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Table 5-4: Relationship between Financial Aid and Degree Completion (continued)

	1	2	3	4	5	6	7	8	9
Field of study (engineering-reference)									
Education				-0.887 (0.31)	-0.2034**	-0.734 (0.31)	-0.1654*	-0.165 (0.30)	-0.0358
Humanities				-0.789 (0.26)	-0.1790**	-0.703 (0.26)	-0.1578**	-0.360 (0.25)	-0.0806
Business				0.584 (0.19)	0.0993**	0.526 (0.19)	0.0908**	0.372 (0.18)	0.0721*
Science				-0.207 (0.20)	-0.0428	-0.216 (0.20)	-0.0447	0.114 (0.19)	0.0235
Agriculture				0.380 (0.26)	0.0683	0.346 (0.26)	0.0628	0.362 (0.24)	0.0702
Other (service)				0.629 (0.31)	0.1056*	0.689 (0.31)	0.1137*	0.800 (0.29)	0.1387**
Entrance exam score (z-score)				-0.061 (0.05)	-0.0122	-0.084 (0.05)	-0.0169	-0.040 (0.05)	-0.0084
Lived in dormitory (off-campus – reference)				0.300 (0.12)	0.0551*	0.285 (0.13)	0.0526*	0.366 (0.12)	0.0711**
Distance from high school				0.000 (0.00)	0.0000	0.00 (0.0)	0.0000	0.000 (0.0)	0.0000
College grade point average				4.247 (0.15)	0.2657***	4.204 (0.15)	0.2655***	4.060 (0.14)	0.2934***
Attended institution (Agricultural University-reference)									
Science & Technical University				0.855 (0.17)	0.1345***	0.887 (0.17)	0.1382***	0.681 (0.16)	0.1219***
University of Education				0.497 (0.30)	0.0866	0.477 (0.30)	0.0836	0.318 (0.29)	0.0624
Institute of Commerce & Business				-1.670 (0.24)	-0.3928***	-1.623 (0.24)	-0.3822***	-1.277 (0.23)	-0.3059***
Institute of Economics & Finance				0.475 (0.34)	0.0832	0.532 (0.34)	0.0918	0.842 (0.33)	0.1444**
Medical University				0.509 (0.29)	0.0884	0.475 (0.29)	0.0832	0.348 (0.28)	0.0677
Received Financial aid (did not receive- reference)						0.657 (0.11)	0.1094***	0.820 (0.10)	0.1416***
N		4398		4398		4398		4821	
Correctly classified cases, percent									
Completed		96.5		93.8		93.8		92.6	
Not completed		12.3		65.6		66.2		68.2	
Overall		73.7		86.2		86.3		85.2	
Nagelkerke R Square		0.112		0.569		0.576		0.582	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Gender

Gender has a substantial influence on degree completion. For the sample, male students have a significant disadvantage (about five percentage points) in completing their undergraduate degrees relative to females net of other factors. However, for the imputed data set, this influence appears to be mitigated by other significant factors such as family status, income level, parents' occupation, etc.

This finding is consistent with a study by Berkner, He, and Cataldi, (2003), who reported higher bachelor's degree completion rates for females within four years (and also after six years) from the start of college study in the USA. Studies by Reynolds (2004), Trusty and Niles (2004) also documented either the males' disadvantage or the females' advantage in securing a bachelor's degree in four years. Female students can be more successful than their male peers even in such traditionally "male" fields as science, engineering, and mathematics (Fenske, Porter, & BuBrock, 2000).

Males' disadvantages in enrollment and educational attainment, particularly at the upper secondary level, in Mongolia, have had previous documentation in some reports (MECS, 2005a; Government of Mongolia, 2006). The evidence here suggests that males continue to experience a considerable disadvantage, not only in enrollment, but also in earning bachelor's degrees. Without further study, however, difficulty remains for relating females' successes in college to greater economic and non-economic benefits they gain after graduation as demonstrated in a study by Perna (2005).

Family Status

Family status appears to be a significant predictor of degree completion for the imputed data set. The status of being independent or married added about 11% to the likelihood of degree completion for those living with parents or dependent on them. This effect may be attributable, surprisingly, to the level of support and encouragement one can receive from the family. Most dependent students (56%) come from the provinces and counties and spend four years with little encouragement or everyday support from the parents. In contrast, married students (in this study independent status assigns, mostly, to married students) receive greater support from their spouses allowing them to focus on college study (Taniguchi & Kaufman, 2005)

Family Consumption Level

Students from average consumption families are about five percentage points more likely to graduate than those with a family income of less than the guaranteed minimum living standard. However, the study does not confirm high family income level as a predictor of greater degree completion rates as often indicated by research (see Trusty & Niles, 2004). Obviously, this situation, perhaps specific to Mongolia, may be realistic if considering the already mentioned tendency of well-off families to seek better educational and occupational opportunities for their children at home or abroad.

Parents' Occupations

Parents' occupations are significant and consistent predictors of degree completion across the two data sets. Parental employment in both formal and informal

sectors provided the students with a six to nine percentage point advantage over chances of earning bachelor's degree for those whose parents are unemployed. Very likely is the possibility that the struggle to find daily living expenses leads some students to interrupt or drop their studies when parental financial support is minimal or absent.

Residence

Another consistent across the data sets and also with the previous research findings is that living in dormitories verses off-campus residence induces a statistically significant positive net effect on degree completion. Previous research suggested that living in on-campus residence halls enhances student's social and academic involvement with their peers, faculty, and the institution and thus facilitates better persistence and chances for degree completion (Pascarella & Terenzini, 2005). However, in Mongolia, this effect may be amplified due to economic and other problems that many students staying with the relatives or family friends face. As one report revealed, the universities and colleges provided residential facilities to only 11,000 students, approximately one tenth of the undergraduate student population in 2005, or to one of six students coming from the provinces. Besides being in short supply, the available spaces provided marginally satisfactory conditions for living (Gerel, 2005).

Nevertheless, the evidence suggests that staying in a dormitory is preferable to looking for an outside place to live. Renting an apartment is neither affordable nor available for students. So, perhaps, those relying on the courtesy or mercy of family friends or distant relatives experience numerous problems, including psychological compatibility that in aggregate may not facilitate better engagement with college study.

Grade Point Average

This research demonstrates that students' academic abilities expressed as grade-point averages have significant positive effect on degree completion. The net contribution of GPA to the likelihood of degree completion is so large that a unit change in GPA increases the probability of degree completion by more than one quarter. This finding is consistent with previous research findings of GPA being the single most important predictor of bachelor's degree completion (Cabrera, Burkum, & La Nasa, 2003; Perna, 1998; Pascarella & Terenzini, 2005) .

Field of Study

Field of study appears to be a predictor of whether students are likely to earn their bachelor's degree or not. For the sample, students studying in the fields of education and humanities were significantly more disadvantaged than those in engineering. Moreover, business and other fields, (the latter consisted of primarily personal service majors such as tourism, restaurant, and hotel management) display a significantly better chance of degree completion than engineering for both the sample and imputed datasets.

By contrast, St. John, Hu, Simmons, Carter, and Weber (2004) found that the students majoring in high-demand fields such as Business, Health, and Engineering/Computer Science, were more likely to persist than those majoring in other fields. They suggested that the economic potential of a major field may substantially influence persistence. Although the relative advantage of business and other fields, grounded in better labor market rewards, can associate with a higher level of motivation of students in these fields, lower chance of degree completion for those studying

education and humanities is less convincing. Perhaps these fields may offer a great flexibility in terms of transfer, interruption, and curricular or course requirements that may result in less persistence as compared to engineering, which is known for curricular rigidity and strict academic requirements.

Although the association of the factors, such as age, high school grade, and family size, with degree completion is in the hypothesized direction, their effect appears to be minimal and insignificant. Also, the study reveals that the entrance exam score, location of high school, and the distance between high school and college have no bearing on bachelor's degree completion after accounting for other relevant influences.

Institution Attended

This study reveals a finding that supports Pascarella and Terenzini's (2005, p. 436) conclusion based on a synthesis of previous research: "Where one begins a postsecondary career continues to affect a student's educational attainment..." The institutions covered by this study significantly differ in student prospects for earning a bachelor's degree, although this difference is not as great as it would be between community colleges and four-year institutions in the USA, to which the aforementioned quote refers.

Relative to the Agricultural University, referenced due to its lowest rate of degree completion, the Science & Technical University offers a significantly greater likelihood of earning an undergraduate degree while students attending the Institute of Commerce and Business, after accounting for the effects of other factors, are at significant risk of not completing their studies on time. The remaining institutions are not much different than

the Agricultural University in this respect. This finding is even more puzzling because both business and agricultural fields (to which ICB and Agricultural University are major suppliers) provide relatively higher opportunity for degree completion than engineering. Although, both the Agricultural University and the Institute of Commerce and Business may lead to cooling of students' educational aspirations (Clark, 1960), perhaps, something significantly different in the academic and/or administrative practices of these institutions is at work that the included variables could not capture. Further study in this area is needed.

Financial Aid Variables

The main focus of this study is to explore possible relationships between the receipt of financial aid and degree completion. The logistic regression analyses of both the sample and imputed datasets indicate that the receipt of financial aid positively affects students' bachelor's degree completion. In other words, after holding personal and family background variables constant, as well as accounting for some during-college factors, students who receive financial aid have a better chance of completing their undergraduate degree than those who did not receive aid. These relationships are statistically significant at 0.001 level (see Table 5-4). The magnitude of this relationship shows that, above and beyond other influences, aid recipients are 11-14 % more likely to complete their undergraduate degrees than non-recipients.

As discussed in Chapter 2, current economic conditions provide little opportunity in the labor force for employment, especially for youth. While 15- to 35-year old youth forms 61% of the economically active population, this age group represents 72% of

unemployment (NSO, 2001b). As a study suggested, finding a reasonably paid job for youth is further complicated by the scarcity of such job places, lack of relationships that may help with employment, and bureaucratic and often unfair hiring practices (Policy Center, 2003). Because of low wages and salaries for younger employees, those who are lucky to have a job typically consider their employment as means of covering daily living expenses rather than as a way of accumulating wealth or financing their college educations (Ibid, p. 80).

In such circumstances, understandably Mongolian students basically rely on parental support or family resources in financing their college educations. The largest expense to be paid in cash is tuition which ranges from 300,000 to 500,000 togrog and comprises 36% of the total cost of attendance for those living with parents (Altantsetseg, 2002). A one time payment of such a substantial sum, approximately ten times the minimum living standard, obviously, is a huge burden, especially for low-income families. Commercial loans are difficult to obtain and interest rates are high. Therefore, poor families often solicit help from close relatives or adult siblings of the student for financial support and if not successful, try to delay the tuition payment for a more economically advantageous time.

However, those from low-income families who are not lucky enough to receive financial aid may have to interrupt their studies due to current practices of tuition collection. When tuition payment is postponed, some colleges and universities use semester-end exams as a device to collect tuition. Unless tuition is not fully or partially paid, those with tuition debts are not permitted to sit for the finals. This practice may

contribute to lower rates of persistence and degree completion of non-recipients, particularly from low-income families.

Without a doubt, the receipt of financial aid is a significant assistance to students and their families. When tuition is paid by financial aid, families living in the countryside could easily contribute to living expenses by providing food from their livestock. For example, a cow or several sheep would be enough of a contribution, at market prices, to cover a large part of living expenses. Therefore, perhaps financial aid basically solves financial problems associated with college attendance for many students of families with livestock.

Students who receive financial aid may focus on their academic studies, become more actively involved in social life, and commit themselves to the goal of graduation. As research indicates, financial aid not only removes a major financial obstacle to college study, but also it has built-in incentives to encourage its recipients to focus on their academic work and other intangible psychosocial benefits (Nora, Barlow, & Crisp, 2006; Taniguchi & Kaufman, 2005).

The positive association of financial aid to bachelor's degree completion found in this study is consistent with previous research investigating the effect of receiving financial aid on persistence and degree completion (see for example, St. John, 1992; Heller, 2003; DesJardins, Kim, & Rzonca, 2003; Cabrera, Burkum, & La Nasa, 2003; DesJardins, Ahlburg, & MacCall, 2002). The magnitude of the effect in different studies, however, ranges from virtually no significance to as much as 20%. However, in their recent review of the research on educational attainment, Pascarella and Terenzini (2005) reported an 11% increase in the likelihood of degree completion as being consistent,

across the studies, as the effect of receiving financial aid. Therefore, the finding of an 11-14% increase is consistent with previous research and the few additional percentage points found in this study may be attributable to the specific features of financial aid in Mongolia, such as linking aid to tuition and the absence of a state subsidy to higher education.

This study sought to examine also the relationship, if any, between different types of financial aid and degree attainment. The results of the logistic regression models estimating the effects of need-based grants, loans, and public employees' tuition grants for the sample and imputed data appear in Table 5-5.

Table 5-5: Relationship between Grant, Loan, and Public Employee's Tuition Grant and Degree Completion

Variables	Sample Model 1		Sample Model 2		Sample Model 3		Imputed Data	
	Coefficients (standard errors)	Delta P	Coefficients (standard errors)	Delta P	Coefficients (standard errors)	Delta P	Coefficients (standard errors)	Delta P
1	2	3	4	5	6	7	8	9
Gender male (female-reference)	-0.717 (0.07)	-0.1613***	-0.256 (0.10)	-0.0534**	-0.251 (0.10)	-0.0524**	-0.169 (0.09)	-0.0367
Age (in 2004)	0.022 (0.02)	0.0043	0.009 (0.02)	-0.0018	0.002 (0.20)	0.0003	0.008 (0.02)	0.0016
Graduated high school in (city-reference)								
Province	0.274 (0.08)	0.0506***	0.105 (0.14)	0.0202	0.001 (0.14)	0.0001	-0.117 (0.13)	-0.0252
County	0.258 (0.11)	0.0479*	0.248 (0.18)	0.0461	0.164 (0.19)	0.0312	0.070 (0.17)	0.0145
High school grade	0.848 (0.08)	0.1337***	0.078 (0.12)	0.0151	0.087 (0.12)	0.0168	0.099 (0.11)	0.0205
Family status: dependent (independent-reference)	-0.572 (0.15)	-0.1261***	-0.311 (0.19)	-0.0656	-0.343 (0.19)	-0.0727	-0.461 (0.19)	-0.1047**
Family income level relative to minimum living standard (low-reference)								
High	-0.219 (0.15)	-0.0454	-0.367 (0.21)	-0.0782	-0.022 (0.22)	-0.0043	0.111 (0.21)	0.0228
Average	-0.112 (0.09)	-0.0227	-0.001 (0.12)	0.0002	0.246 (0.13)	0.0458	0.294 (0.12)	0.0581**
Parents' occupation (unemployed – reference)								
Private sector	0.480 (0.10)	0.0840***	0.306 (0.14)	0.0561*	0.325 (0.14)	0.0593*	0.321 (0.13)	0.0630**
Public sector	0.966 (0.12)	0.1471***	0.645 (0.16)	0.1078***	0.467 (0.18)	0.0820**	0.476 (0.16)	0.0899**
Self-employed or retired	0.444 (0.10)	0.0785***	0.317 (0.14)	0.0579*	0.323 (0.14)	0.0589*	0.427 (0.13)	0.0816***
Family size	0.063 (0.02)	0.0123**	0.029 (0.03)	0.0057	0.028 (0.03)	0.0054	0.024 (0.03)	0.0051

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Table 5-5: Relationship between Grant, Loan, and Public Employee's Tuition Grant and Degree Completion (continued)

1	2	3	4	5	6	7	8	9
Field of study (engineering-reference)								
Education			-0.887 (0.31)	-0.2034**	-0.720 (0.31)	-0.1619*	-0.148 (0.30)	-0.0321
Humanities			-0.789 (0.26)	-0.1790**	-0.688 (0.26)	-0.1541**	-0.339 (0.25)	-0.0757
Business			0.584 (0.19)	0.0993**	0.529 (0.19)	0.0899**	0.366 (0.18)	0.0710*
Science			-0.207 (0.20)	-0.0428	-0.209 (0.20)	-0.0431	0.127 (0.19)	0.0260
Agriculture			0.380 (0.26)	0.0683	0.335 (0.26)	0.0610	0.348 (0.24)	0.0677
Other (service)			0.629 (0.31)	0.1056*	0.687 (0.31)	0.1134*	0.797 (0.29)	0.1384**
Entrance exam score (z-score)								
			-0.061 (0.05)	-0.0122	-0.086 (0.05)	-0.0174	-0.042 (0.05)	-0.0089
Lived in dormitory (off-campus – reference)								
			0.300 (0.12)	0.0551*	0.290 (0.13)	0.0533*	0.371 (0.12)	0.0720***
Distance from high school								
			0.000 (0.00)	0.0000	0.00 (0.00)	0.0000	0.000 (0.0)	0.0000
College grade point average								
			4.247 (0.15)	0.2657***	4.205 (0.15)	0.2655***	4.062 (0.14)	0.2934***
Attended institution (Agricultural University-reference)								
Science & Technical University			0.855 (0.17)	0.1345***	0.887 (0.17)	0.1382***	0.678 (0.17)	0.1216***
University of Education			0.497 (0.30)	0.0866	0.473 (0.30)	0.0829	0.308 (0.30)	0.0606
Institute of Commerce & Business			-1.670 (0.24)	-0.3928***	-1.615 (0.24)	-0.3804***	-1.271 (0.23)	-0.3044***
Institute of Economics & Finance			0.475 (0.34)	0.0832	0.541 (0.34)	0.0931	0.849 (0.33)	0.1454**
Medical University			0.509 (0.29)	0.0884	0.477 (0.29)	0.0835	0.348 (0.29)	0.0677
Received Grant (did not receive any aid – reference)								
					0.777 (0.14)	0.1250***	0.975 (0.13)	0.1612***
Received PST grant								
					0.540 (0.18)	0.0930**	0.643 (0.16)	0.1163***
Received loan								
					0.573 (0.18)	0.0977***	0.715 (0.17)	0.1270***
N								
		4398		4398		4398		4821
Correctly classified cases, percent								
Completed		96.5		93.8		93.8		92.6
Not completed		12.3		65.6		65.6		68.2
Overall		73.7		86.2		86.2		85.3
Nagelkerke R Square								
		0.112		0.569		0.576		0.582

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Bivariate relationships between degree completion and financial aid suggest that the effects of different forms of financial aid on degree completion may be very similar (see table 5-3). However, multivariate analyses showed a considerable difference (see Table 5-5).

The multivariate analysis indicates that all other things being equal, the largest impact on degree completion is the need-based tuition grant. Need-based tuition grant recipients were 12-16% more likely to complete their undergraduate studies than those who received no financial aid. The effect of loans was a bit smaller, but still substantial, 10% for the sample and 13% for imputed data.

Given the fact that a public employee's tuition grant is awarded to the children of more educated teachers, doctors, and government officials on the basis of a merit (GPA of no less than 2.0), one might expect that the effect of a public employee's tuition grant would be somewhat higher than that for other financial aid. However, this was not the case: the effect was the smallest, about 9 – 12%. Evidently, the GPA requirement is not as strict as it is supposed to be. Lower graduation rates for public employees' children can also have partial explanation from the increased opportunity for those with high academic ability to continue their studies outside the country and an adverse socialization opportunity for not-so-high performing but more affluent students. The latter deserves some clarification.

With countless bars, restaurants, night clubs, and gambling places, city life in Ulaanbaatar presents students with many sources of distraction from their studies. Some cafeterias near campus serve beer and other alcoholic drinks even during lunch time. Drinking and prostitution are among the critical growing social problems pertinent to

youth (Policy Center, 2003). Therefore, the possibility exists that a part of the student body from well-off families are being affected by these destructive problems, in spite of their receiving financial aid as a reward for their parent's service to the government.

Numerous studies demonstrated that receiving grants enhances one's chance of securing an undergraduate degree especially if the student is from a low-income family. The finding in this study, that need-based grants increase the likelihood of earning bachelor's degree by 12-16%, favorably compares with the finding of Cabrera, Burkum, & La Nasa (2003). They found that the net effect of receiving grant-in-aid increased the chance of completing a bachelor's degree within four years by seven percent.

Research on the effect of loans on degree completion detected differing effects. Kim (2003) found a significant effect of loans on degree completion only for middle-income students. However, Metz (2001) and Cabrera, Burkum, & La Nasa (2003) reported a significant, positive effect of receiving loans (similar to what has been found in this study) on the degree completion regardless of students socioeconomic status. Notably, however, comparison of loan effects is useless if loan programs are very different. In Mongolia, government loans for students are, indeed, very similar to grants in that recipients need not worry about repayment, even though the arrangement is called a "loan."

The positive effect of merit-based grants for students of public employees, found in this study, adheres to the finding by DesJardins, Ahlburg, and MacCall (2002). They found that merit aid decreased students' chance of stopping out. The reverse association between stopping out and graduation suggests a direct effect of merit aid on degree completion as this study establishes.

In relating the findings of a study to the findings of another, one should bear in mind the possibility that the effect of financial aid may vary due to many different factors (Somers & St. John, 1997; Heller, 2003) including contextual difference. Also to be noted is that findings presented here are consistent with, and provide support for, the initial hypotheses.

Multivariate logistic regression analyses provide predicted probabilities of bachelor's degree completion for each individual case of the sample and the imputed dataset. Knowing how these predicted degree completion rates compare with the descriptive analyses is an interesting aspect. For this purpose, predicted probabilities of the sample have been recoded into dummy variables and respective cross-tabulations performed. Figures 5-4, 5-5, and 5-6 show the predicted degree completion rates by institution, family consumption level, and parent's occupation.

Comparing these figures with respective Figures 5-1, 5-2, and 5-3 makes clear that the more accurate multivariate predictions of degree completion are typically higher than the observed rates of degree completion. Also evident is that the difference between aid recipients and non-recipients in undergraduate degree completion resulting from multivariate estimation is often larger than the observed degree completion rate that takes into account only one factor (whether institution, family consumption, or parent's occupation). This result emphasizes the value of multivariate analyses.

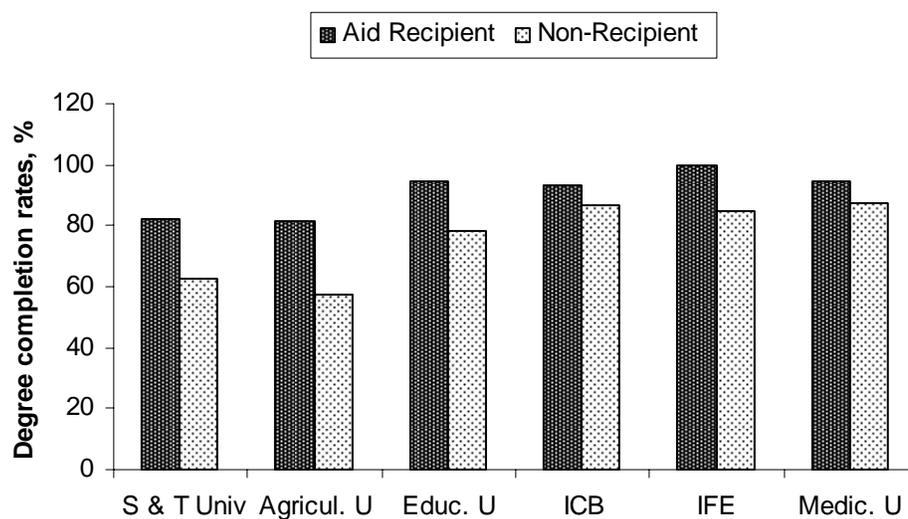


Figure 5-4: Predicted degree completion rates by institution.

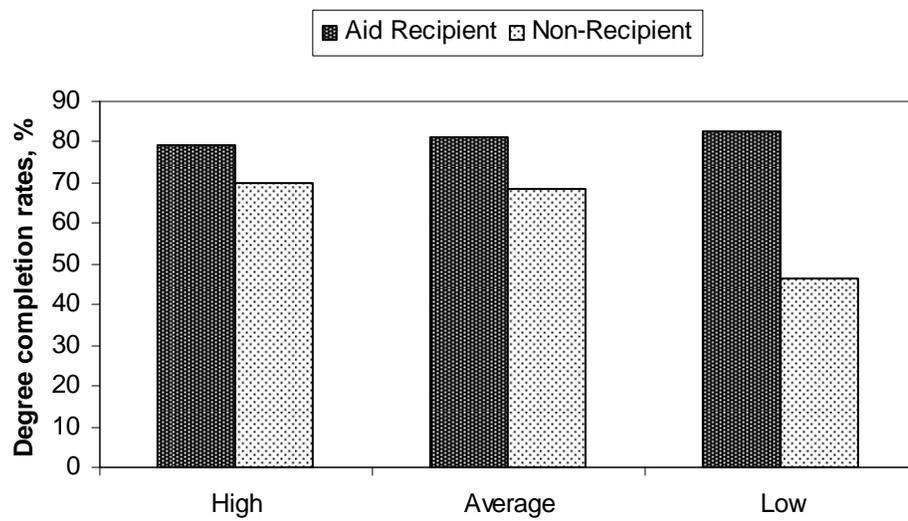


Figure 5-5: Predicted degree completion rates by family consumption level.

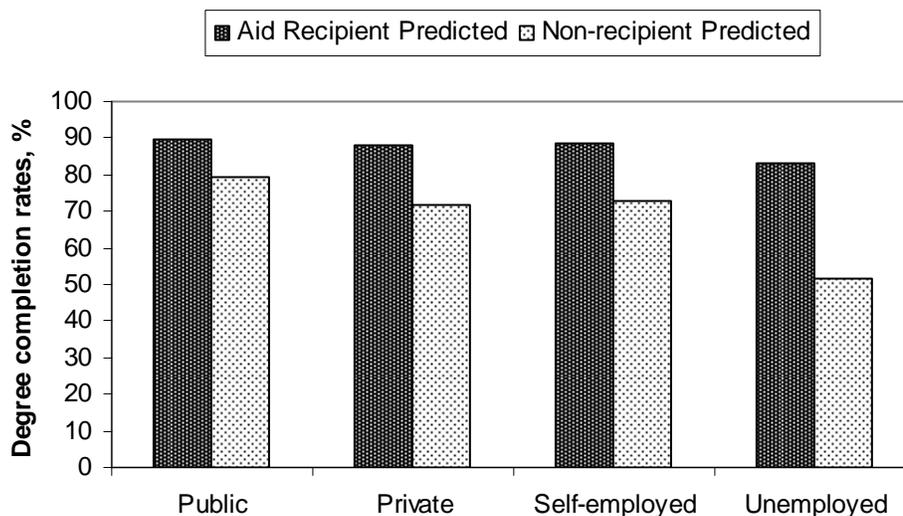


Figure 5-6: Predicted degree completion rates by parent's occupation.

Indirect Relationships

This study conceptualizes that student's academic ability, institutional characteristics, financial aid, and students' socioeconomic and family background characteristics influence the dependent variable, degree completion, in both direct and indirect ways. The existence of not necessarily causal, but at least correlational, relationships among predictor variables would indicate viability of the conceptual framework. To check if these relationships exist, but not to the extent to cause a multicollinearity effect on the dependent variable, two measures have been taken: assessing changes in the coefficients from Step One thru Step Three in the logistic regression models, and a stepwise entering of mediating variables one at a time.

As Tables 5-4 and 5-5 show, pre-college characteristics, such as family status, high school grade, family size, and the location of high school have significant

relationships with the degree completion in Model One. Dependent students have fewer chances of graduating than independent or married students. Those who graduated high school in the provinces or counties have a better chance of earning a degree. High school grades and family sizes positively relate to degree completion. However, these effects tapered and lost significance when Model Two included some institutional variables. Apparently, these variables have a more indirect, rather than direct, effect on degree completion. Variables, such as field of study, institution, entrance exam score, residence, college GPA, and distance between high school and college, masked their influences.

Likewise, the effect of gender and parents' occupations also slightly attenuates from Model One to Model Three, suggesting that some of the variances are absorbed by other factors. For the analytic purpose, a valuable insight is knowing which variables are more likely to carry indirect effects of pre-college factors. A way to assess this influence is to examine how the coefficients of these background variables change when second and third block significant predictors entered one at a time. If any indirect influence of pre-college factors on the dependent variable exists, that occurrence may be through those predictors that significantly affect whether a student is likely or not to complete an undergraduate degree.

Table 5-6 shows how regression coefficients for students' pre-college background characteristics do change when the model includes significant predictors of degree completion one by one. The table permits developing some conclusions about the indirect effect of background characteristics as follows:

- The attenuation of the gender effect is mostly due to college GPA and the institution. Perhaps, GPA carries the largest indirect effect of gender with the institution being the second.
- Field of study, institution, and residence alike reduce the effect of high school location; however, GPA and the receipt of grant, loan, or public employee's tuition grant are mainly responsible for making the factor insignificant.
- The effect of high school grades is slightly enhanced with field of study, residence, and institution, but abridged with GPA and financial aid. Evidently, college GPA mediates high school grades' relationship with the degree completion.
- For family status and family size, college GPA appears to be a main intermediary variable responsible for making the former an insignificant predictor of degree completion.
- The attenuation of parent's occupation effect on degree completion occurs as a result of an aggregated effect of field of study, GPA, residence, institution, and financial aid. However, college GPA, again, appears to be a cause of a large reduction in the regression coefficients for all three categories of parent's occupation. Notably, the receipt of financial aid (perhaps, public employee's tuition grant) substantially diminishes direct effect of parents being employed in the public sector.

Table 5-6: Regression Coefficient Change of Pre-college Variables Induced by College Experience Variables

Variables	Model 1 coefficients	Change with field of study	Change with GPA	Change with residence	Change with institution	Change with grant, loan, & PST grant
Gender male (female -reference)	-0.717***	-0.065	-0.600	+0.009	-0.117	-0.016
Graduated high school in (city-reference)						
Province	0.274***	-0.038	-0.161	-0.071	-0.036	-0.136
County	0.258*	-0.063	-0.129	-0.083	-0.055	-0.125
High school Grade	0.848***	+0.056	-0.444	+0.004	+0.192	-0.055
Family status: dependent	-0.572***	-0.027	-0.293	-0.004	-0.058	+0.011
Parents' occupation (unemployed – reference)						
Private sector	0.480***	+0.026	-0.172	-0.006	+0.039	+0.044
Public sector	0.966***	+0.008	-0.302	+0.002	-0.037	-0.201
Self-employed or retired	0.444***	+0.013	-0.136	-0.008	+0.002	-0.008
Family size	0.063**	+0.002	-0.035	-0.001	+0.001	0.007

* p<0.05; **p<0.01; ***p<0.001

Chapter 6

IMPLICATIONS, RECOMMENDATIONS AND CONCLUSIONS

The previous chapter outlines the results of descriptive, logistic regression, and stepwise analyses of the relationships between financial aid and degree completion when accounting for some alternate influences. As described, the key findings are that financial aid does help the students to complete their undergraduate degrees and this effect varies by type of financial aid for this particular group of students. The following section outlines some of the implications of these findings for policy makers and institutional leaders responsible for establishing and executing financial aid programs. As a reminder, the findings and implications of the study, in large part, refer to the six institutions that have not been randomly selected. Due to the lack of the data, establishing the representativeness of, or evidence for distinguishing these institutions from the rest of public higher education in Mongolia is not possible. Nonetheless, the results may be useful to other institutions, unless a compelling argument exists that their student body is much different than those in the six studied institutions.

Implications for Policy and Practice

Student financial aid policy in Mongolia began in the early 1990s and since then its criteria, types, amount limitations, and implementation arrangements remained largely unchanged. Although policy makers currently have greater concern for how to support

the children (see Chapter 2) than for the student financial aid policy, public concern for its effectiveness is on the rise. The State Training Fund reportedly runs a deficit over 22 billion togrog, largely due to unpaid loans from undergraduate loan programs and overseas postgraduate training. The Master Plan for Education Development for the 2006-2015 period (Government of Mongolia, 2006) reflects the need for an efficient and improved policy, including financial aid, to support students at the tertiary level. Without a doubt, the present is the time for serious reform of student assistance policies.

In times of fiscal constraints, the responsibility for making wise choices among different policy options falls to the policymakers. The dilemma here is where to spend limited public resources: in populist endeavors with unclear outcomes or in programs with tangible social and economic returns. Student financial aid clearly is an area where the investments made are likely to yield substantial economic and social returns. This study provides evidence that financial aid does really help many students to earn their college degrees. Maintaining existing student financial aid programs and increasing allocations for them must be a priority to assure citizens the equal right to education. The larger proportion of the allocations must be directed towards need-based grant programs that evidence, here, shows to be the most effective in helping the students.

From a student perspective, any type of financial aid is welcome since aid lowers the financial burden associated with a college education. However, from the public policy perspective, the effectiveness of financial aid programs is a primary concern. Indeed, it is an inefficient investment if the money spent on student assistance is not serving the way it should.

As the findings suggest, the largest, in terms of aggregate funding and number of recipients, public employees' tuition grants, appear to be least effective in helping students earn an undergraduate degree. An issue that may explain this finding is that it is awarded to students without any consideration of family income. As previous research showed, financial aid is most effective when it meets real or unmet financial needs of students.

An objective of the Education Master Plan for 2006-2015 (Government of Mongolia, 2006) advocates the use of student loans and grant programs in order to increase enrollment in engineering, technology, natural science, education, and agriculture. In view of the shortage of government resources for creating new student assistance programs, method of achieving this objective would be to reform current public employees' tuition grants, to direct funding towards students in those priority fields. Still, family income eligibility should be a central criterion in awarding the grants.

Findings suggest that student loans are beneficial and they should be maintained and expanded. In Mongolia, loans act as grants. However, given the current, miserably low, repayment rate and extremely large deficit, the loan program, in its present form, is unlikely to last long. Therefore, for needed reform, an acceptable idea is to convert outstanding debts into grants and start a new loan program on a commercial basis. Since government resources have their limitations, the necessity is for mobilizing private resources for either expansion of existing programs or launching new loan programs. Commercial banks can provide more flexibility in terms of accessibility and amounts of loan defaults, although government may still guarantee the loans and subsidize the interest. In this way the government could save several billions from current government

loan programs that can be reallocated into need-based grant programs. The guide for policy reform in student loan programs should include international experience of good practices in this area.

In improving the implementation of the student financial aid policy, a key issue that needs serious consideration is income eligibility, and how to determine the eligibility of students for financial aid. As shown in this study, approximately 84% of grant awards are on the basis of financial need. Local administration has the responsibility to assure and certify that a student is eligible for financial aid or is from such a family. However, how local administrative units determine the family income level is unclear and no monitoring procedures are in place to assure the veracity of family claims. Currently, means-testing does not really occur. In order to make sure that aid is provided to those who are really in need, more meticulous examination of financial eligibility grounded in an appropriate methodology, is desirable. Such a methodology should contain not only a reliable technique to determine the family income, but also a method to reasonably estimate the expected family contribution towards college costs.

Student financial aid policy would be more effective in the presence of assurance that aid covers all students who needed it. As documented in this study, although 91% of students are from families with consumption levels around or below official minimum living standards, only 32% received need-based grants or loans, suggesting that many eligible students did not receive any assistance (see Table 5-1). Obviously, the current practice of awarding financial aid to already enrolled students on a “first come-first served” principle within the quota of an institution does not really promote more a equitable distribution of financial aid. Allocating a certain number of aid awards to an

institution may not work well, due to the impossibility of correctly predicting how many eligible students will be admitted to that particular institution.

An alternative to the current decentralized system would be a centralized administration of financial aid. In this system, a prospective student, who successfully passes a national general education test, and therefore, becomes eligible for a college education, should be able to apply for financial aid prior to admission. Hence, the student could take that approved financial aid to the institution of choice. Reviewing all the applications in one place allows the streamlining of the financial assistance award process. Centralized administration also has the advantage of disseminating financial aid information to prospective students while they are in high school, and thus, may positively influence their decisions and choices for higher education.

These outlines, issues and recommendations are addressed to the Ministry of Education, Culture and Science and the State Training Fund and to be considered and implemented within executive administration without major political decisions. However, one recommendation needs political support: increasing allocations for financial aid programs.

Currently, frequent changes of the government and political instability in the country creates a sense of uncertainty about the future of any policies including student financial aid. However, already noted in Chapter 2, student financial aid policy gained and is likely to have continued support from both rival political forces, the MPRP and the Democratic Party, because financial aid policy responds to both their political platforms: social protection of the poor and market-based reform. Therefore, no danger exists for financial aid being discontinued. The problem arises when trying to increase funding for

financial aid, because, currently, policymakers favor competing programs, such as children's money, lunch for primary school children, financial support for newly wedded couples, newborn children, and their mothers. Therefore, lobbying for increased funding, higher education administrators and the ministry officials should emphasize tangible returns and outcomes as well as successful international experience in financial aid programs.

Not only policymakers, but also institutional leaders and officials responsible for the implementation of financial aid programs may take note of the findings of this study in view of several aspects.

Students' performance and graduation rates are key criteria of institutional performance, especially, since the enactment of the Public Sector Finance and Management Law in 2003. This law imposed a contractual arrangement between the Ministry of Education and the public universities and colleges for the quality and the quantity of the "output" or service that higher education institutions must deliver. In these contracts, the specified increase in average GPA reflects the quality of education, and the number of credit hours produced or the number of graduates are the measures of the quantity of education (Sukhbaatar, Bat-Erdene, & Yeager, 2003).

The results of this study emphasize that colleges and universities ought to consider, not only academic performance, but also the economic and other non-academic factors that improve students' chances for success in college. Doing so requires consideration of the following three worthy issues:

First, in light of a finding that aid recipients, particularly, of need-based tuition grants have better chances of graduating, colleges and universities should carefully consider financial needs of individual students, so that aid is appropriately awarded to those who need it. Also vital is implementing measures for promoting scholarships and fellowships from sources other than the government. A part of tuition revenue can also be effectively recycled into institutional aid, which may not necessarily be awarded only on the basis of academic merit. In awarding need-based grants, particular attention should be given to male students, with unemployed parents (those who may be most at-risk as indicated by this study).

Second, this study suggests an approach for tackling persistence and graduation issues through improving residential facilities. By providing enough dormitory spaces, at reasonable costs, and maintaining an adequate level of support services, universities and colleges can facilitate better engagement of students with the institution both academically and socially. As a result, students may have improved chances of degree completion. Therefore, a critical issue is for higher education institutions to direct necessary resources and efforts to improve conditions and increase the number of available dormitory spaces.

Third, the study indicates the existence of a considerable difference in graduation rates among the institutions and across different fields of study. The issue is not simple and has no ready answer. However, institutions should consider at least two things. A study of the developmental needs of youth (Policy Center, 2003) revealed that in choosing a college major and future profession, Mongolian adolescents consider future benefits, earning potentials, and the availability of employment to a greater extent than

their own ability and/or the advice of friends, family, or faculty. If this is the case, then the possibility exists that the aforementioned difference is due to the enrollment of a large number of students who academically or otherwise simply do not fit the major or the institution. Students of all ability levels have a higher chance of graduating if the quality of their college “matches” their ability level (Light & Strayer, 2000). The existing mismatch can be reduced if faculty and student affairs officials provide an adequate level of individual counseling, advising, and career development services that are not in regular practice at higher education institutions. In addition, remedial courses can be a useful vehicle to enhance some students’ success in college. Again, those kinds of support services should be directed towards those who are most likely to leave college despite financial aid.

On the other hand, colleges and universities need to improve the practice of assessing the performance of programs or departments with regard to degree completion. When individual programs have proper evaluation, potential areas for improvement can always be found. Likewise, similar programs at different institutions could greatly benefit from the information made available through specialized program level accreditation, which is in the beginning stage of development in Mongolia.

Findings presented in this study may also be relevant to educators in contexts similar to Mongolia. Former Soviet Republics of Central Asia (Azerbaijan, Kazakhstan, Kyrgyz Republic, Tajikistan, and Turkmenistan) share many commonalities with Mongolia, such as a socialist past, current transition, and socioeconomic contexts. What has happened in one country’s education system can be applicable to another’s as lessons learned, because all these countries have the same starting point for reform—the Soviet

model of education. As researchers note, enrollment and completion issues, admission procedure, fit between education and the labor market, and student financial support are among the common concerns across these countries (Weidman, Chapman, Cohen, & Lelei, 2003).

As a valuable reference for the educators in the Central Asian countries, this study:

- Provides a detailed description of student financial aid programs in Mongolia.
- Documents major policy changes for financing higher education from state subsidies to student financial aid over the past decade.
- Discusses how, in the absence of policy research, the populist election agenda of political forces drives policy initiatives that have huge financial implications.
- Demonstrates the net positive impact of receiving financial aid on undergraduate degree completion.
- Provides evidence that different types of financial aid have varying effects on students' prospects of earning college degrees.
- Contributes to the understanding of how student's various family backgrounds, individual characteristics, and college experiences can directly or indirectly relate to the likelihood of persistence and degree completion in a transitional context.
- The framework and methodology applied in this study may be useful to scholars in similar contexts in guiding their search for more sophisticated

research opportunities in the scarcity of reliable, longitudinal data and information.

Recommendations for Future Research

This research highlights some opportunities for future research. This study presents the first of its kind conducted in the transitional context of Mongolia and is limited to a specific cohort of students. Since difficulty remains for finding a universal effect since the effect of financial aid may change over time, further study with different student groups, including those in private institutions is needed. In doing so, researchers should consider the issues identified in this study:

- Previous research has well documented that the effect of financial aid varies by students' socio-economic status. Considering the importance of family socioeconomic status to success in college education, better measurement (better than that used in this study) of family income is needed. This can be done using population and household survey data or through a specially designed survey. Any measurement of family income, however, must consider not only cash income, but also the substantial size of income from subsidiary economic activity or livestock.
- Likewise, parents' education levels should be included in future study to examine the intergenerational transmission effect of educational attainment.

- The study clustered financial aid into three large groups: need-based, merit-based, and loans. Further study should make a distinction between particular financial aid programs (for example, for herdsmen's children, large families, and the disadvantaged) and also the ethnicity of students in order to more accurately determine the relative effectiveness of different programs for varying social groups. The information about the effectiveness of student assistance programs would be more complete if future research examines their impact on access and enrollment.
- The positive effect of financial aid found in this study is attributable to its ability to remove financial burden. However, how the receipt of financial aid affects students and their families in a socio-psychological respect may be worth investigating.
- A finding in this study indicates that living in dormitories is better than living with parents or others. However, the study was not able to clearly determine if the advantage of living in a dormitory associates with increased socialization or decreased economic problems. Separating those living with parents from those staying with relatives or family friends (or just renting a place for living) in a future study may provide an insight into this issue.
- As this study points out, academic fit may be an issue in Mongolia worth examining since the likelihood of degree completion differs significantly by institution after accounting for fields of study, financial aid, and other factors.

- Although research (see for example, Hoffman & Lowitzki, 2005; Zwick & Sklar, 2005) suggested that pre-college academic performances, such as high school grades and entrance exam scores, are important predictors of students' success in college and college degree attainment, they did not have a net effect on degree completion in this study. A problem with the entrance exam scores is that they were not compatible across the institutions. The recommendation is that standardized national test scores (which have now become available) be used in future studies.

In Mongolia the study of higher education is just at the beginning stage, compared to research in primary and secondary education, which has a long record and established organizational, human, and financial support systems. Study of higher education needs both institutional and financial capacity building. A cost-effective approach for developing research into higher education would be a collaboration of universities and colleges. The recently established Center for the Study of Higher Education at the Science and Technical University can serve as a focal point for collaboration, to which colleges and universities can contribute financial and human resources.

However, research in higher education also needs improvement in methodological aspect. Sporadic research papers often suffer from a lack of reliable data and methodological rigidity. A contribution of this study is that it offers a theme for research, namely, student financial aid and degree completion, an applicable methodology, and an initial dataset, which can be expanded and enriched. Specific findings outlined in Chapter

5 provide initial benchmarks for future scholarship that would estimate the effects of various factors associated with degree completion in Mongolia.

Conclusion

This thesis examines the relationship between financial aid and bachelor's degree completion for a cohort of students enrolled at six public universities and colleges in Mongolia. As described in Chapter 5, the findings are generally consistent with previous research in this area. The findings suggest several insights pertinent to economic aspects of student financial aid:

First, this research reinforces the idea that the impact of receiving financial aid may be enhanced in a low-income and transitional context and when the total amount of financial aid is effectively linked to tuition level that is not subsidized from public sources.

Second, the study supports the notion that need-based tuition grants may be the most effective tool for enhancing persistence and degree completion of low-income students.

Third, heavily subsidized government loans may be as effective as need-based tuition grants in removing financial barriers to degree completion when linked to tuition and directed towards low-income students.

Fourth, the positive impact of tuition grants for public employees' children on undergraduate degree completion appears to be less than the impact of need-based tuition

grants, even though public employee's grant is awarded to only academically qualified students without income consideration.

Fifth, although the impact of student financial aid on enrollment is not a purpose of this study, the evidence presented here permits the conclusion that, at least for Mongolian public higher education institutions, government-sponsored financial aid programs may have played some role in the recent phenomenal growth of higher education by supporting those who otherwise would not be able to persist and graduate from college.

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APPENDICES

Appendix A

Template for Institutional Data

Institution: _____

Requested data	Number assigned to a student	Birth Year	Gender	Year enrolled
Explanation	Use four digit numbers	Year student was born	Male or female	Year a student started as freshman

Template for Institutional Data (continued)

Major	Name of city, province, or county where graduated high school	High School Grades	Entrance Exam Scores	Family Status
Name of a major or program		Mean grade of finals considered in college admission	Actual score	Options: With parents, Married, Orphans

Template for Institutional Data (continued)

Parents' Occupation	Family consumption level (relative minimum living standard)	Number of family members	Financial aid	Type of financial aid
For each of the parents indicate: Public, Private, Self-employed, Retired, Unemployed (as of fall 2000)	Options: high, average, low	Number of family members including parents	Received or Did not receive	Options: Loan, Grant, Public servant's tuition grant

Template for Institutional Data (continued)

Number of years received aid	Current status (as fall of 2005)	Year student left the institution	Grade point Average	Place where student lived mostly
	Options: Graduated, Still Enrolled, Left the institution (dropped, transferred, expelled)		At time of leaving the institution	Dormitory, off-campus

Appendix B

Grouping Majors into Field of Study

Code	Field of Study	Majors
1	Education	Athletic teacher Computer teacher Engineer teacher English language teacher Informatics teacher Math and physics teacher Math teacher Mongolian language and literature teacher Preschool methodologist Preschool teacher Primary school teacher
2	Humanities	Chinese study Cultural study English and Russian language translation Fine art History Industrial design Information and library Japanese study Mongolian literature Philosophy, Political science Psychology Social study Sociology Social worker Technical art
9	Other (Service)	Environmental protection Hotel and restaurant Sports trainer Tourist Guide

Grouping Majors into Field of Study (continued)

Code	Field of Study	Majors
3	Business	Accounting Advertising Agricultural management Agricultural merchandise Cybernetics Banking Banking economics Business law Econometrics Economics Financial management Human resource management Industrial management Information system management Insurance Insurance economics International trade Management Manufacturing management Marketing management Public administration
6	Science	Biology Biomedicine Chemistry Computer programming Ecology Economic data processing Economics and statistics Geography Geology Geophysics Hygiene Industrial computing Information systems Information technology Math and statistics Mathematics Medicine Pharmacy Physics Traditional medicine

Grouping Majors into Field of Study (continued)

Code	Field of Study	Majors
8	Engineering	Agricultural engineering Construction material production technology Electrical engineering Engineer Exploitation of construction machinery and equipment Food biotechnology Food processing machinery and technology Food production technology Forest technology Furniture technology Geology and drilling Geology of mineral exploration Heating and ventilation Leather and fur technology Manufacturing engineering Manufacturing technology Machinery technology Meat and dairy production technology Metal and steel production technology Mineral exploration equipment and machinery Mineral exploitation technology Mining technology Printing technology Textile technology Wood and wooden product technology
7	Agriculture	Agricultural biotechnology Agronomy Cadastre Crop agronomy Farming Forestry Geo-ecology Land cartography Landscape architect Land surveying Pasture management Plant study Veterinary

Note: For the simplicity, social science majors are included in the humanities, and health majors – in the field of science.

VITA

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1974 – 1978	Institute of National Economy (Russian Academy of Economics)	Diploma (equivalent to a bachelor's degree) June 1978
1978 – 1987	Faculty Mongolian State University	
1987 – 1991	Director Trade Policy Division Ministry of Trade and Industry, Mongolia	
1991 – 1996	Director College of Commerce and Business, Mongolia	
1998 – 2000	Maastricht School of Management (outreach program in Mongolia)	M.B.A. April 2000
1996 – 2001	Executive Director Consortium of Mongolian Management Development Institutions	
1996 – 2001	Education Specialist – National Consultant for various projects in Mongolia funded by Asian Development Bank	
2001 – 2002	Hubert H. Humphrey Fellow Pennsylvania State University	
2002 – 2007	Doctoral Candidate College of Education Pennsylvania State University	
2002 – 2005	Research Assistant Center for the Study of Higher Education Pennsylvania State University	
2005 – 2007	Managing Editor Comparative Education Review Pennsylvania State University	