

Funding Higher Education in Uganda in an Era of Growth.

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Introduction

This note presents a review of the system of funding higher education in Uganda and provides government and stakeholders with some options for meeting the twin goals of increasing participation and quality in higher education, especially in science-related disciplines.

Uganda is one of many countries in sub-Saharan Africa currently experiencing a boom in higher education. Over the past twenty years, enrolments have increased six-fold, a growth level reminiscent of those seen in some Asian countries in the last quarter of the twentieth century. Moreover, the presence of Makerere University, one of the continent's oldest universities, ensures that Uganda has a regional reputation as a leader in higher education.

But growth has not come without its challenges. The historic advantages that Makerere provided Uganda were mostly thrown away during the country's years of violence in the 1970s and 1980s. The boom of the last few years can be seen as the sudden release of pent-up demand from all those years. Yet this flood of interest, which began in the mid-90s, poured across a terrain that had been eroding for the better part of twenty-five years. Challenges were inevitable. This note shares insights on how to meet these challenges.

Part I provides an overview of the current situation of Ugandan higher education. It begins with a brief review of the country's recent social and political history and continues on to describe the historical development and current situation of the country's higher education system². The final section provides an overview of the current state of debate about the way forward in improving financing of higher education in Uganda.

In part II, possible solutions are outlined. The Government of Uganda has two broad policy goals for higher education. The first is to increase the number of graduates, especially in the areas of science and technology. The second is to expand access to universities to a broader selection of the Ugandan population, allowing those of lower socio-economic status to benefit as much as possible from higher education. Policies to achieve both of these goals are presented in Part II.

Forty-five years ago, at independence, Uganda had one of Africa's finest universities and was considered a leader in higher education. There have been many lost years since then, but the *desire* to make Uganda a leader again is undimmed. It is seen in the daily sacrifices made by so many Ugandans: of parents, scrimping and saving to send their children to school; of students, studying hard in tiny libraries; of professors, working on little pay to pass on the knowledge they have gained, and on senior administrators, many of whom have given up potentially far more lucrative jobs in North America and Europe in order to build up Ugandan universities. There is

² This might have been a very long chapter, given the current challenges facing Uganda's universities. However, as several other recent works (Kasozi 2004, Kasozi 2009, Liang 2004, Visitation Committee 2007) have already outlined these challenges in some depth and hence the discussion of these issues has been kept very short.

enormous potential in Uganda – the ability its universities have shown in accommodating vast student inflows on such small budgets should be proof of that.

Now, as issues of poverty eradication begin to fade into the background and issues of growth and development come to the fore, it is time for Uganda to re-assess its higher education policies and re-equip the sector with the policies and resources required to make it a dynamic engine that can help power the Ugandan economy for decades to come. With the right investments, and with the right incentives, Ugandan universities can regain their position of leadership in African higher education and bring prosperity to the nation.

Part I – the Current Situation

1. Overview of Uganda’s Social and Political Situation

Education remains a priority in Uganda’s Poverty Eradication Action Plan (PEAP), which is based on five pillars: economic management, enhancing productivity and competitiveness, security, good governance and human development. Education lies with the human development pillar of the PEAP, and the overwhelming priority for education with the PEAP is the continuing implementation of Universal Primary Education (UPE) and the newly launched Universal Post Primary Education and Training (UPPET), which is focusing on lower secondary and the equivalent grades for technical and vocational education. One of the United Nations’ Millennium Development Goals, UPE has been a particular challenge in Uganda, because the country has one of the world’s highest birth rates. Population growth is currently about 3.6% per year, and a fertility rate of 6.7 children per woman. As a result, even though UPE is now said to have been fully achieved, program costs continue to increase along with the burgeoning youth population.

Government expenditure on education as a share of GDP stands at 3.45%³. Between 1997 and 2005, education received the largest share of the Government budget—over 20 percent each year. Due to budgetary pressure to expand investments that primarily drive growth (energy, roads, and other sectors), the education budget share dropped to 17.5 percent in 2007, with 65 percent allocated to primary education and 23 percent to secondary education. Because of the two ongoing mass reforms at the primary (Universal Primary Education – UPE program) and secondary (Universal Post Primary Education and Training – UPPET program) education levels, higher education, receives 12% of the education sector budget.

The newly launched National Development Plan (NDP) is the first in a series of six plans intended to move the country towards the national vision of a transformed modern economy in the next 30 years. It thus broadens the strategic focus from ‘poverty reduction’ to ‘structural transformation’ to raise growth and living. Uganda thus has the opportunity to take an evolutionary step in its policy focus and transition from simple poverty eradication to economic growth. Higher education is expected to play a major role in this transformation process.

Uganda has a record of strong growth. Per capita income grew at about 4 percent per annum over the past decade. Real GDP grew at 8.7 percent in 2007/08, 7.1 percent in 2008/09 and is projected to decelerate to 6 ½ percent in 2009/10 before rebounding to potential growth of about 7 percent over the medium term. Uganda’s economic growth rates have been impressive in comparison with other countries, and particularly so during the global crisis. In order to sustain or accelerate this growth, the Government of Uganda has to think more strategically about how to move away from an economy based nearly exclusively on agricultural exports and towards a greater emphasis on small manufacturing and services. This in turn requires a commitment to

³ World Bank (2009). The Efficiency of Public Education in Uganda. Washington, DC.

higher levels of attainment in tertiary education. In short, the time has come for Uganda to take questions of higher education policy much more seriously.

2. Over view of the Ugandan Higher Education System

i) History and Growth

Uganda higher education system has shifted from purely public to a combination of public and private. The Ugandan system of higher education dates back to 1922 and was predominantly financed by the state. But the situation changed with cost sharing in 1992 and allowing private universities to operate starting 1998. In 1992, Makerere University for the first time allowed fee-paying students to attend classes as well as scholarship students, thus introducing cost-sharing to the country's public sector universities. Though private universities were permitted as of 1988, there was not an instantaneous flood of applications to start up a university. The first were Uganda Martyrs' University (UMU) Nkozi and Ndejje University in 1993, followed by Bugema University and Nkumba University in 1996, and Uganda Christian University (UCU) Mukono in 1997. Significantly, all of these institutions were backed by an existing religious community and were non-profit in orientation. Since 2000, there has been a proliferation of university-level institutions, with more than 20 new institutions being formed. This more recent wave of institutions differs somewhat from the older ones in that 60 percent do not have a religious connection; some are philanthropic in nature and some are for-profit institutions

Expansion was not, however occurring solely in the private sector. At Makerere, the introduction of fees sparked a major boom in enrolment, four public universities were established, and there was almost a 30 fold increase in university enrolment over 20 years. In the late 1980s Makerere normally enrolled about 2500 students each year; by 2006, this number had increased to 31,081. Mbarara, on the other hand, grew more slowly and as of 2006 had fewer than 2000 students. In the past decade, three new public universities have come into being. In 2002 Gulu University was established on lines similar to Mbarara University (i.e. as a rural institution with a specialization in science and medicine). Two other universities, Kyambogo in Kampala and Busitema, were founded through mergers of smaller specialized post-secondary institutes in 2001 and 2007, respectively.

Enrolment by institution in the most recent year for which statistics are available (2006) is shown in table 1:

Table 1 –Enrolment by Institution; Uganda (2006)

Type of Institution	Number of Students	Percentage Enrolment
Public Universities	56,005	41 Percent
Private Universities	36600	26.6 Percent
Non University Institutions	44,585	32.4 Percent
Total Tertiary Enrolment	136,728	

Source: National Council on Higher Education Annual Report 2006.

In addition to the universities listed above, the 2006 NCHE report also included three other universities – Central Buganda, Luwero and Nile – with a total enrolment of 452. Because these institutions are currently considered illegal institutions in Uganda, they have been removed from the totals presented here.

The past 20 years have, therefore, been a time of extraordinary growth in Ugandan higher education. At the start of 1988, there was but a single public university with an enrolment of under 3000. By 2006, there were four public universities (plus the Makerere University Business School, or MUBS) with a collective enrolment of 56,005 and a growing legion of private universities with a collective enrolment of approximately 36,000. In total, that makes a 30-fold increase in university enrolment in just over 20 years. The final piece of the puzzle is the roughly 45,000 students enrolled in various small specialist institutions.

Even though the country has experienced dramatic population growth which might be thought to imperil the country's attainment rate, the country's gross enrolment ratio (GER) in tertiary education has risen steadily over the past two decades from just under 1% to between 4.6% and 6% in 2006, depending on the definition of GER being used.⁴ Comparisons to other countries in sub-Saharan Africa are difficult to make because of lags and gaps in data availability and also because of discrepancies between the Ugandan data reported to UNESCO and that reported by

⁴ The Gross Enrolment Ratio is a method used to describe national participation rates. It is obtained by dividing the total student population by a certain fraction of the population which is considered to be relevant for measurement. The method used by the NCHE to describe the Gross Enrolment Ratio uses all tertiary students in the numerator and the population age 18-24 in the denominator, which results in a participation rate of 4.6% (NCHE, *The State of Higher Education and Training in Uganda 2006*, p. 103). This is a different method than the international standard designed by the UNESCO Institute for Statistics, which uses as a denominator the aggregate population for the five year-ages following normal completion of secondary school, which in Uganda's case would be 18-22. What this means is that the NCHE method provides a much lower ratio than the international ratio. Using the international standard, the GER figures for Uganda are in the range of 6%.

NCHE.⁵ However, it would appear that Uganda's participation rate is likely to be comparable to or higher than most other countries in the region, except South Africa and Nigeria.

⁵ As of January 2008, the last year for which UNESCO data is available for Uganda was 2004. In that year, UNESCO reports 54,000 students in education level 5A; NCHE, for the same period, shows 68,079 students in universities and another 40,000 in various colleges, medical institutes, agricultural institutes, etc. It is not clear if some of these are excluded because Uganda considered them to be ISCED 5B or ISCED 6. Whatever method used, it is clearly generating a much smaller numerator for GER than is being used by the NCHE (see footnote 1, above) in its calculations – the NCHE prefers using all students enrolled in all universities, colleges and institutes.

Table 2 – Gross Enrolment Ratios, selected comparator countries, 2004

	GDP per capita (PPP) US\$	Gross Enrolment Ratio, ISCED levels 5A and 6
Cambodia	2381	3.04
Lao People's Democratic Republic	1892	5.85
Ethiopia	959	2.48
Ghana	2320	3.15
Kenya	1164	2.75
Uganda	1371	3.47
United Republic of Tanzania	688	1.25
Zambia	959	2.34*

* GER data from Zambia is from 2000.

However, while growth rates have been impressive, the type of growth has not quite been as desired as the number of students enrolled in science related courses remains low due in part to limited science offerings and low supply of science students from secondary schools. There is now broad agreement in Uganda that something needs to be done to begin to reverse the ratio. The Government of Uganda has on repeated occasions stated that it believes that the ratio of science graduates (a term which includes graduates in medicine, engineering and related technology disciplines) to non-science graduates needs to be about 80-20, and has moved to make science subjects compulsory at O-level. The actual ratio of enrolments in 2006 was 27-73: only one in four students in higher education is in a program deemed to be in Science and Technology.

Some believe that the cause for this situation is that cash-strapped universities will not or cannot supply seats in expensive science programs; others contend that it is as a result of lack of demand for science courses among students who only rarely have access to quality science programs at the secondary level and so shy away from attempting to learn it at the tertiary level. However, a positive trend is beginning to emerge in this area: between 2004 and 2006, the actual number of students enrolled in science programs nearly doubled, with the largest increases coming in universities (up by 9,630 students or 99%) and in commerce and business colleges (up by 5,024 students or 278%). But these impressive gains are coming from a low base, and much more needs to be done in this area to reach government goals.

No description of the Ugandan higher education would be complete without a description of the National Council on Higher Education – the regulator. Created by the Universities and Other Tertiary Institutions Act of 2001, the Council was created to “regulate and guide the

establishment and management of institutions of higher learning; and regulate the quality of higher education, equate qualifications and advise the government on higher education issues". Though it has no direct role in funding, it acts as a quality assurance agency, an accreditor both of public and private institutions and of individual programs, and a general information provider about higher education in Uganda, (notably as the central source for the collection and dissemination of statistical data).

ii) **The Challenges of Growth of Higher Education in Uganda.**

Human and physical capital are the key constraints to delivery of expanded, high quality higher education in Uganda. This combination of low levels of physical capital and human capital has led to a general shift towards lower-cost programming. Science, technology and medicine programs are expensive not only in terms of equipment, but the people capable of teaching such programs are on high demand and can command much higher wages (if not in Uganda, then abroad). In terms of human capital, the key input is trained scholars willing to spend their time teaching in a higher education environment as opposed to going to work in the private sector or for government research organizations. This, to a large degree, requires that institutions be able to pay salaries that are at least moderately competitive with those provided by other employers of highly qualified personnel. What makes this an even more challenging task is that for highly qualified personnel, these "other employers" are not limited to the domestic scene; people with advanced degrees are highly mobile and can quite easily move elsewhere in Africa or even to Europe or North America. According to regular surveys conducted by the National Council on Higher Education, wages account for about half of all expenditures at most universities – slightly more at public universities. The question is whether or not this sum is sufficient to attract and retain a professoriate that is sufficiently large and sufficiently talented to provide a quality education to those who desire it. This question is virtually impossible to answer definitively in an empirical sense. Is the current professoriate large enough? Well, we know that overall student-staff ratios are about 25:1, and appear to have remained so despite system growth. From 2004 to 2006, as the number of students in universities rose from 63,000 to 94,000, Ugandan universities managed to keep pace by increasing their total academic staff numbers from 2,561 to 3,927. However, it is possible that some of the growth recorded in the private sector may consist of staff from public institutions moonlighting in second jobs and that what is being recorded is a growth in academic positions rather than an actual increase in staff. Is 25:1 sufficient? Again, very difficult to tell: UNESCO does collect some statistics on student-staff ratios, but national inconsistencies in how part-time students and part-time staff are counted making it difficult to be sure of what is actually being measured.

Are staff sufficiently talented? Again, definitions are key. Nationally, only about 18% of university staff have doctorates, with 56% having master's degrees and the remainder holding a Bachelor's degree. Most would probably say that there are too few with doctorates and too many with just bachelor's degrees, but again international comparative data is scarce and in any

case a skeptic might question the value of higher degrees if they improve someone's technical skills without improving their abilities as educators to better *impart* knowledge.

Inability to pay competitive salaries within a constrained budget is a bottleneck to attracting and retaining qualified staff. From within institutions, however, one tends not to hear so much about the issue of hiring more staff; rather, it is staff development (that is, increasing the qualifications of staff members) which appears to be the more important issue, particularly with respect to staff in the sciences. The key problem here is pay, which must be competitive with that of not only domestic employers, but of other *regional* ones as well, since skilled personnel are highly mobile. Institutions' inability to provide salaries which are competitive not only domestically but also regionally becomes a problem. A 2005/06 study completed by Dr. Kasozi suggested that rates of pay at all levels in Uganda were about 20% below where they were in neighbouring Tanzania and 60-70% below where they were in South Africa. Clearly, attracting and retaining staff on currently available budgets is a challenge, and as other countries also expand their systems of education, the scale of the challenge will only increase.

Deficiency in physical capital is another major bottleneck in the expansion of higher education. Physical capital includes buildings, classrooms and office space as well as the physical equipment and specimens required for working laboratories, workshops and experimental spaces, as well as assets such as monographs, journals and computers. Statistics from the National Council for Higher Education provide data on available space per student. Data from 2006 indicate that, collectively, Ugandan universities were able to provide 0.78 square metres (sqms) of lecture space per student, 0.2 sqms of library space per student and 0.39 sqms of laboratory space per student. It is difficult to judge the adequacy of these figures through international comparisons because of the difficulty in obtaining comparable data. In the US, lecture room space per student appears to be about 1.1 sqms; in the UK it is over 2sqms/FTE student. US library space per student is also about 1.1/sqms per student and lab/studio space come to over almost 4sqms per student (though much of this space may be dedicated to research work and not be available to undergraduate students. In Ontario, Canada, there is just under 2 sqms/FTE student of "class and class labs". Clearly, Ugandan institutions are significantly more cramped than this.

Moreover, it is not simply that quantity of space that matters, but also the quality, and the condition of much of the physical plant is dilapidated. At Makerere, for instance, of the seventeen main buildings on campus, only three have been constructed within the last ten years and a majority of buildings were built before independence. Private universities fare somewhat better on this score. Despite having much smaller resources available to them, some private institutions have been able to engage in a considerable amount of new construction. The ability of UCU, UMU and IUIU to devote funds to physical infrastructure compares very favourably to that of public institutions such as Makerere, Mbarara and Kyambogo. But though the difference

between the two sectors on this point is telling, it should not obscure the fact that all Ugandan institutions face serious deficiencies of physical capital.

The following quote from the Visitation Committee Report to Public Universities (2007) demonstrates the status of physical capital, such as equipment for laboratories.

In the Science and technology faculties at Makerere, the laboratories are not only too small to accommodate the growing student numbers, but the equipment is old (dating back to the 1960s and 1950s) or has broken down due to lack of repairs and maintenance. Laboratory materials such as chemicals and specimens are in short supply. As a result, during lab sessions, most students are reduced to the role of observers, merely recording the results of a few who can access the equipment and the material inputs. There has been no additional equipment at the Faculty of Technology since the 1970s and no provision for maintaining and repairing equipment – in a faculty that trains engineers! Of the 12 oscilloscopes that the faculty started with in 1972, only one is still functional. The faculty is short of technicians and the turnover is very high due to poor pay. Not surprisingly, there have been wide spread complaints that students in the science and technology faculties concentrate on theory to the neglect of practical training due to lack of equipment, materials and laboratory space.

The lab/workshop facilities at Kyambogo, MUST and Gulu are hardly different from those at Makerere. At Kyambogo, the small lab and workshop facilities inherited from ITEK and UPK respectively have been stretched to the limit. Since 2003, no improvements have been made to upgrade the labs and workshops to university level standards and to take into account increased university enrolment. At MUST, where the science block is still under construction, there are no laboratories, and the University has until recently been sending students to Makerere for practical sessions during vacations. Currently chemistry and physics are using medical laboratory at the Hospital for teaching which is not designed for that purpose. Given the poor state of Makerere science labs it is logical to conclude that the teaching of science at MUST is also more theoretical than practical. It is also hard to imagine how the MUST program in science laboratory technology can be effectively conducted without lab facilities in the science faculty. Although MUST is planning to start an engineering faculty, the Visitation Committee saw no evidence of lab/workshop preparations for that program. With poorly equipped technology engineering programmes at Makerere and Kyambogo, is it reasonable to start another program at Mbarara? Gulu University is in the process of establishing Physics, Biology and Chemistry labs. Some equipment has been bought though some of it is not suitable for university level work. Gulu lacks experienced academics and senior technicians to oversee the procurement of lab equipment and

supervise its installation. The Department of Technical Education lacks a workshop and, as in the case of MUST, it is hard to see how the planned engineering faculty will become operational without lab/workshop facilities. As new institutions, MUST, Gulu and, indeed, Kyambogo, will require substantial funds to establish or upgrade their labs/workshops to provide acceptable facilities for practical training as part of the science and technology programmes. The National Council for Higher Education, which is mandated to accredit programs should have used its power to clear, close or accept the teaching or opening of these programs. But it is underfunded and cannot do all that is required to do.

The Visitation Committee's remit covered only the public institutions, but their observations about equipment and laboratories would be no less true of private institutions.

Funding higher education is another bottleneck. Behind these bottlenecks in human and physical capital, of course, is the issue of funding. The 2008/2009 Ministerial Policy Statement foresaw roughly 104 bn US\$ in transfers to the five public universities: Makerere (including MUBS), Mbarara, Gulu, Kyambogo and Busitema. Figures from the same document foresaw these institutions also adding another 100bn or so in “non-tax revenues” (meaning cost-recovery activities, by far the most important of which is tuition fees), meaning that these five institutions had a total income of just over 200 bn US\$. Figures for income at private universities are not available but a reasonable guess is that there are about 50,000 students attending these institutions, each paying about 1 million US\$, for a total of another 50 bn US\$. This would imply that total resources in the country's universities would be just over 250bnUS\$; of this roughly 40% comes from public sources and 60% of which comes from private sources.

Table 3 - Funding to Public Universities in Uganda, 2006

	Public resources, (including sponsorship) In bn US\$	Fees and other non Government sources In bn US\$*	Total Funding in bn US\$	Students in (2006)	Revenue per student (M US\$)
Makerere University (incl. MUBS)	65.3	73.7	139.0	41812	3.3
Mbarara University	7.6	3.5	11.1	1790	6.2
Gulu University	6.9	3.4	10.3	1837	5.6
Kyambogo University	15.6	18.8	34.4	10566	3.3
Busitema University	8.3	0.5	8.8	n/a	n/a
Total	103.7	99.9	203.6	56005	3.6**

*Non-Tax revenue is principally revenue from tuition, but also includes sales of ancillary services.**excluding Busitema

Source: 2008/09 Ministerial Policy Statement; State of Higher Education and Training in Uganda 2006

Makerere University accounts for just under two-thirds of all public expenditures in higher education and claims just over two-thirds of total revenue at all public universities in Uganda. However, since Makerere accounts for about 75% of all enrolments (if the Makerere University Business School is included in the overall total), this implies that it actually receives something less than its share of money based on simple headcount. Mbarara and Gulu universities, with their focus on higher-cost programs in science and medicine, receive substantially more funds per student.

In terms of total government expenditure, higher education has over the past decade consistently received between 9 and 13% of total expenditure on education; in 2008/09, the government forecast was 11.6%. Within the education budget, what has changed most significantly over the past few years has been the percentage of the budget allocated to Primary education – this went as high as 72% in 2000 while the push for UPE was at its highest, but has now fallen to 59%. The main beneficiary of this change has been the secondary sector, now feeling increasing strain as many of the graduates of the UPE go on to continue their education. Its share of total spending has nearly doubled, from 12% in 2000/01 to nearly 23% in 2008/09. As the first class of UPE “graduates” is now of age to attend higher education, one might reasonably expect that higher education would start to see the kind of “demographic bump” that the secondary system has received over the past decade, but the government of Uganda has yet to indicate that anything of the kind is being considered. However, even if no increase in the share of educational expenditures are forthcoming, some improvement can still be expected due to the fact that the government’s long-term economic framework envisages education’s share of the entire government budget to rise by over 50 % over the next few years.

3. The State of the Debate on Funding in Higher Education

The national debate about funding higher education has centred around two separate arguments, which can be summarised, “How can institutions get more money from students”? and “how can institutions get more money from government”? The broad thrust of the arguments is correct: more funds are indeed needed if the system is to prosper. But as with most things, the devil is in the details.

Proponents of higher payments by students have made two arguments; one based on need, and the other based on comparative costs. The first argument is that current levels of fees have been insufficient to fund high-cost programs in science and technology, and that higher fees are required for the delivery of such programs. The second argument is that fees in universities are not much higher than fees in better-quality secondary schools and much less than in certain comparable developing-world countries and hence students should be able to afford more. This

discussion is usually accompanied by an acknowledgement that fees are in fact quite high compared to average national income, but also with an assurance that as soon as a proper student loan scheme is implemented, any difficulties in affordability will be swept away.

Though it may seem sensible to charge fees more in line with program costs, post-graduation income prospects act as a limiting factor here. Even with student loans, the idea that the system will be able to generate large new resources by convincing large numbers of young graduates to take on debts of 8-9 million shillings (the inevitable consequence of some proposals involving the doubling or tripling of tuition) requires a certain degree of optimism. In addition, student loan programs in developing countries are not known for their cost-efficiency; a massive ramp-up in costs funded through student loans may well wind up being paid for by governments rather than by students.

This does not mean that higher tuition fees and student loans should not be on the agenda; Part II indeed will argue that both should be adopted – but carefully, and without exaggerated expectation.

Could Government of Uganda be spending more on higher education? Many analyses have noted that higher education receives somewhat less than 10% of the overall education budget, or just a little under 0.3% of GDP. Even among developing countries, these figures are on the low side. The dynamic of the debate on public funding of universities has for several years been framed by the issue of “unit costs” or “average per student costs” – the idea apparently being that if institutions can simply convince government of the real unit costs, then the government will see the light and fund institutions accordingly.

Current unit costs are lower than the realistic cost. The largest study on unit costs to date was completed by the Makerere Institute of Social Research in 2001-2002. This is some years out of date but it still taken as the primary source of data on unit costs by the National Council on Higher Education (NCHE) and so has gained a certain degree of currency within Uganda. The key data from this survey are reproduced below in table 4.

Table 4 – “Unit Costs” by discipline in USD, MISR Unit Cost Study 2001/02

Degree Programmes	Current Unit Cost	Preferred/realistic cost
Medicine (MUK)	3,451	6,141
Medicine (MUST)	4,588	8,217
Agriculture	2,888	3,246
Veterinary	3,603	4,495
Dentistry	3,451	6,141
Basic Science	1,971	3,179
Business/Commerce	1,278	1,691
Arts/Social Science	709	2,051
Education	710	1,840
Fine Art	1,434	2,207

Two other smaller institutional-level studies on unit costs have been done since then (notably by Mbarara University of Science and Technology and Uganda Martyrs University). Each appears to have used a slightly different methodology and the results, both with respect to current and preferred unit costs were slightly different as well. These represent honest attempts to quantify actual costs and show the gap between what is available and what is thought to be ideal.

Unit costs are *inherently* variable, and searching for a single, national objective “standard unit cost” on which to base funding is like chasing a chimera. Even holding field of study constant, unit costs vary according to the size of the program, the method of program delivery and the available physical resources. To understand why, imagine a class of fifteen students taking place in a room with thirty places. Once a professor has been hired, the marginal cost of adding another fifteen students is very small. Naturally, as the number of student rises towards thirty, the average unit cost falls. However, once the class reaches thirty students, there is an inflexion point and decisions need to be made. A new classroom has to be built or leased. If the new classroom is larger than the old one, then a single teacher can handle an increased number of students; if the new classroom is the same size as the old one, then a new teacher has to be hired. Either way, unit costs increase dramatically at the inflexion point and then begin to decline again. Unit costs for a particular subject are therefore bound to vary significantly from one institution to another because each has a different array of inputs of physical and human capital.

While the unit cost studies might have had some problems in determining actual or ideal costs, the fact remains that whatever institutions are being paid right now is simply insufficient to provide quality education. The evidence presented earlier is clear: institutions eschew expensive science and engineering programs in favour of cheaper arts and humanities programming. Campus infrastructure is crumbling. Laboratories and workshops are without equipment. One way or another, institutional revenues per student need to rise. Increases in fee revenues might assist to some degree, but if the government is serious about wanting a wholesale shift from arts programs to science programs, then public funding clearly needs to be part of the picture.

Goal I – increasing Higher Education enrolments, particularly in the sciences.

Institutions’ per-student income – from both private and public sources – is simply too low to make it worthwhile to invest in programs such as Agriculture, Health, Technology which have – all of which have higher costs because of infrastructure, materials, and fiercer international competition for faculty. The result is an active avoidance of sciences, weak physical infrastructure and poor laboratory equipment.

The government’s stated goal is to expand the number of spaces in higher education and to radically increase the number of students studying in science and engineering disciplines. However, the current incentives facing institutions are leading them to offer predominantly non-

science-based programs in Arts, Social Sciences and Business where the costs involved are for the most part limited to instructor salaries. The solution lies in providing more resources to Makerere, which accounts for over 60% of all Bachelor's level graduates in Uganda and holds a central position in any future plans for the expansion of scientific research in Ugandan universities, and making changes that make it easier for institutions to raise funds on their own. But also necessary is a change in the incentives facing institution. Several recommendations are made in this section.

- ***Increase Private Expenditures on Higher Education***

Tuition revenues are the single largest source of income, accounting for roughly half of all revenues in public universities and close to 100% of revenues at private institutions.

However, for most students, mobilizing funds for tuition is difficult. Often, the funds do not come just from family – sometimes, five or more people (including both immediate and extended family) may chip in a few thousand shillings per person to help individual students make their tuition payments. Though there are no hard figures on the numbers of students who are forced to abandon their studies for lack of funds, interviews with personnel at a number of institutions suggest that roughly ten percent of students in any given semester fail to make tuition payments prior to exams and are therefore forced to re-take at a later time. So while it is possible that a number of students could bear higher costs, it is also true that there is a substantial number of students that would have difficulty doing so without assistance.

A number of commentators, including the 2007 Report of the Visitation Committee to Public Universities, have recommended that in tandem with a rise in tuition fees some system of student loans needs to be instituted. However, the simple fact that a loan program exists does not mean that tuition can go up exponentially; ability-to-pay will remain a concern.

Institutions claim that they are constrained by government in the amount of tuition they are able to charge. Though institutions are in theory able to set their own tuition, in practice the Government of Uganda discourages institutions from doing so; in part, it is thought, because the Government fears student unrest. It is certainly true that in the last couple of years, the reluctance to allow tuition to rise has been problematic and inflation has been eating away at the value of the revenues raised through tuition, which has compounded institutions' financial troubles. But it is also true that even before inflation began to bite, institutions appear to have been reluctant to raise tuition much above their current levels; all historical accounts of Ugandan higher education are clear that the reason that cheaper arts programs were privileged over science and engineering programs was because students could not actually bear the cost. That suggests that institutions themselves believe that there are very practical limits to tuition beyond which institutions cannot go before affecting demand. A loan program might alleviate this constraint somewhat, but it would not eliminate it.

How high can tuition go? It is worth noting that even in developed countries with well-functioning systems of student loans and grants, tuition remains relatively low. This is not simply a function of having greater public resources at their disposal; rather, public sentiment in these countries worries about the ability of disadvantaged students to pay their fees, and of recent graduates to shoulder a burden of debt upon entering the working world. Though no country has stated it as an explicit policy rule, in practice there appears to be a rule of thumb among developed countries with tuition fees that neither average tuition over the course of a degree or average debt at graduation should not be much more than half of the full-year salary of the average new graduate (the main exception to this rule are US private 4-year universities). Table 5 shows tuition fees, average student debt and starting salaries in various developed countries.

Table 5 – Tuition, Student Debt and Post-Graduate Debt, Selected Countries

	Years to degree	Annual tuition	Total tuition	Average Debt at Graduation	Average salary after graduation	Debt-to-income ratio
Canada	4	C\$5,053	C\$20,212	C\$18,900	C\$38000	50%
United States**	4	US\$13,575	US\$54,300	US \$19,300	US \$38,000	51%
United Kingdom	3	£3,070	£9,210	£8800	£22000	40%
Australia	4	A\$5,845	A\$23,380	A\$14697	A\$38000	39%
Netherlands	3	€2,410	€7,230	€8700	€28000	31%

*Data is latest available; for tuition it is 2008, for debt and salaries it is 2004.

** Data for the US includes both public and private institutions and is skewed steeply by the large amounts paid by about 30% of student who attend public institutions. Costs for students in public institutions is similar to that se

How much debt for tuition? To arrive at a rule about tuition and debt maxima is more difficult but basically, one has to imagine the following: if a student had to borrow all of his or her tuition, how much debt could he or she reasonably expect to bear, given his or her likely income immediately following graduation? In most countries that limit would appear to be fairly close to the point where the ratio of debt at graduation (or total tuition) to expected income after graduation equals one.

So what are current levels of post-graduation income in Uganda? Here we must turn to the Tracer Study of the Class of 2002, which was conducted by the NCHE in 2005 and 2006, as this is the best available source of data on graduate incomes. This study does have weaknesses: it was not designed to gather data on income with a high degree of accuracy (as shown below in Table 6, the data was collected as an interval variable, and so a great deal of variation was lost).

Moreover, data was not available by faculty; however, the text of the document, suggests that graduates of programs in medicine and commerce had the highest post-graduation salaries.

Table 6 – Average Income After Graduation, Uganda University Graduates of 2002

Monthly Remuneration (UShs)	Total (%)
Below 200,000	34 (7.0)
200,001-500,000	191 (39.1)
500,001 – 1,000,000	168 (34.4)
1,000,001 – 1,500,000	69(14.1)
1,500,001 – 2,000,000	16 (3.3)
2,000,001+	7 (1.4)
Employed but not receiving an income	3 (0.6)
Total	488 (100%)

Source: National Council on Higher Education Tracer Study of the Class of 2002

What can be determined from this is that as of 2005, the median income for graduates was somewhere just above 500,000 shillings per month; if we assume that responses within each category are distributed more or less equally, then the median is around 567,000 shillings/month or about 7 million shillings per year. From our earlier rule of thumb, that suggests that it would be difficult to raise average annual tuition fees much above 2.3 million/year (i.e. 7 million shillings over the course of a 3-year degree).

If tuition is to be set as a function of debt at graduation, then the nature of the student loan program (if any) becomes a fairly important variable, because of the likely high rates of interest that will need to be charged. If the government were to cover nominal and real interest on the loans, then tuition over three years could be equal to a first year salary. But if interest will accrue on loans while students are in school (a much cheaper option for government), then the interest charges would have to taken into account and tuition discounted accordingly. Table 8 shows the effect of carrying loan interest on final net debt, assuming that loan maxima are set equal to tuition and the goal is to achieve a net debt of approximately 7 million shillings (i.e. equal to one year's median salary). The table shows that with 15% interest over three years (that is, the likely interest rate for a non-subsidized loan), average tuition would only be able to rise to about \$1.75M UShs, a discount of about 25% on the total tuition bill.

Table 7 – Effect of loan subsidies on net debt

	Tuition yr 1	Tuition yr 2	Tuition yr 3	Total
Without interest (nominal)	2,330,000	2,330,000	2,330,000	6,990,000
With 15% interest (nominal)	1,750,000	1,750,000	1,750,000	5,250,000
(with interest, after 3 years)	2,661,531	2,314,375	2,012,500	6,988,406

This level of tuition would not, of course, be the same across all fields of study – presumably it could be higher in some programs such as medicine and commerce where graduates appear to enjoy higher starting salaries; but equally, it would need to be lower in others where salaries were not so high (presumably most programs in Arts and Sciences). **With most programs currently having tuitions closer to a million shillings per year, that leaves significant room for tuition growth, but it would almost certainly leave tuition levels short of the 50% of the “ideal” costs of education recommended by the NCHE in its 2005 annual report.**

All told, tuition could probably double if the Government of Uganda would be prepared to absorb student loan interest costs, and rise by half if it did not. Even the latter would still bring in another 125BnUshs/year (based on existing student numbers) – which would represent a not-inconsiderable increase of about one-third in total revenues.

Finally, if tuition rules based on post-graduation income were to be adopted, then it would be essential for the Ugandan government to pay much more attention than it has done to date on monitoring labour market outcomes of education. At a minimum, it would need to run studies similar to (but hopefully larger than) the Tracer Study of the Class of 2002 conducted by the NCHE on a biennial or triennial basis, in order to re-establish the baselines for tuition regularly.

- ***Increasing Public Expenditures on Higher Education***

Increased government funding is necessary if government wishes to substantially re-orient universities towards the sciences and equip them accordingly. However, this should not be done at the expense of primary and secondary education at especially this stage when the sector is grappling with quality implementation of UPE and UPPET mass reform programs. The key questions are: how much money needs to be invested? how should it be spent? and how can it be made available?

The share of the overall Government education budget is projected to increase over the period to 2014, to approximately 1.5trn Ushs. So even without increasing its share of the overall education budget (currently 11%), higher education can expect to see an increase of approximately 65% over the next five years. Beyond that, one might expect that the tertiary sector could receive something similar to the “demographic bump” that the secondary sector

recently received. However, this may not happen for the simple reason that Uganda's extraordinarily high fertility rate will continue to exert pressure on the country's primary and secondary school budgets. It would be different if fertility rates began to fall – then one could make the case that as the rate of increase in new enrolments at primary schools fell, some of the “dividends” of this fall could be re-invested in tertiary education. In the absence of a fall in fertility, doubling the higher education sector's share of the pie at the expense of primary and secondary schools seems a tall order in light of the existing constraints to quality education at the primary and secondary levels.

- ***Adopt Formula Funding***

This would mean adoption of a predictable formula which is enrolment-based and which takes account somehow of differences in *relative* costs, and involve paying institutions at least in part, based on the number of students they enrol, with extra money going to institutions that enrol more students in higher-cost programs. This would help to distribute funds to institutions in a fairer, simpler and more efficient manner.

This not to say that the government should be paying for each student based on some notion of “average unit cost”. As we noted in Part I, it is not clear that the “average unit cost” is a particularly useful figure for a system challenged with quality expansion of education. Average unit costs can vary widely depending on the array of physical inputs available, because marginal costs can be high or low depending on the amount of space available.

Even if a single unit cost per discipline were quantifiable, it is almost inconceivable that a government would fund it. There are a number of reasons for this, but the basic one is that as a commitment it is probably too open-ended and leaves no incentive for cost-containment at an institutional level. Unit costs rise, inexorably, due to Baumol's Law⁶. No government wants to be locked into a funding formula where the unit value inexorably increases, especially when one of the government's main policy goals is to increase the number of units. Neither does a government want to be stuck with a system where the institution has no incentive to restrain costs, as would be the case if governments simply paid actual unit costs. So while it is important to have a system of funding which is regular, predictable and – crucially - reflects differential program costs, the solution cannot be unit costs.

⁶“Baumol's law”, sometimes referred to as “Baumol's disease” refers to the way in which labour-intensive goods tend to increase in price relative to other goods, for the simple reasons that they are inherently less likely to see productivity gains. The classic example is a Mozart string quartet. Since Mozart's time, there have been no productivity improvements in the performance of these musical pieces – it still requires four people, playing for exactly the same amount of time. But the price of listening live to such a performance has gone up enormously in the interim; what was popular entertainment a hundred years ago is now affordable only to an elite paying large sums of money to listen in large concert halls. So it is in higher education, where the main teaching technology – the lecture – dates back to Socrates and productivity gains (other than cramming more students onto a lecture theatre) are hard to come by. In an economy where innovation is relentlessly reducing the labour content of manufactured goods and services, the cost of providing labour-intensive higher education will inevitably become more extensive, relatively speaking.

In jurisdictions where funding formulae exist and provide differential amounts of funds by field of study, the amount given usually does not represent the full amount of the unit cost. Instead, it can be a very simple formula whereby every student enrolled in a non-science course results in an institutional subsidy of X (e.g. 500,000 shillings/year) and every student in a science-related course results in an institutional subsidy of $2X$ (e.g. 1,000,000 shillings/year). The actual figures used do not matter; indeed, given the realities of government budgeting, it is quite likely that the value of “ X ” will change somewhat from year to year.

Such a system provides very clear signals to institutions about the benefits of investing in more expensive programs. Should government ever wish to increase the number of students in particular programs, it need only tweak the formula slightly to change the incentives to institutions. Second, and equally important, a formula funding system does not remove incentives surrounding efficiency. Regardless of where the amount is set, greater institutional benefits can always be gained by lowering the cost of delivery and re-investing the surplus elsewhere within an institution. However, this requires a certain degree of budget autonomy.

Internationally, this is a fairly common method of distributing government funds. The recent OECD thematic review on post-secondary education describes formula funding as the most common method of allocating block grants to institutions, and in most such systems, differential funding by field of study. Among the many countries using such systems are Australia, New Zealand, the Czech Republic, Estonia, Sweden, the Russian Federation – as well as many individual Canadian provinces and US states as well. If Uganda chose to adopt such a system, it would not lack for models that might fit its particular circumstances. One thing is certain, however: the adoption of such a system requires verification mechanisms. One would expect a rigorous auditing scheme to be adopted alongside such a system, in order to ensure that institutions were reporting true enrolment numbers.

- ***Increase Institutional Budget Freedom***

Allowing public universities to carry money forward from year to year could aid in the creation of new and badly needed buildings on Ugandan campuses. One of the more curious and noticeable features of Ugandan higher education is that there has been considerably more construction of new facilities at private institutions over the past decade than there has been at public ones. At first glance, this makes little sense: private institutions, which do not benefit from government subsidies, have far fewer resources than public ones – so how can they afford the construction? True, the cost base of private institutions is lower; unlike public institutions, they do not by and large offer the more expensive science and technology programs such as engineering, science and medicine (indeed, over half of all graduates from “science-based” programs at private universities in Uganda come from a single program – Kampala International University’s Technology program). Though both may be able to charge something greater than marginal unit cost (tuition fees in arts and humanities programs tend to be comparable across public and private institutions at a little over one million shillings per year), public universities

have a number of very expensive programs to cross-subsidize while privates have the ability to channel these “profits” into new construction.

However, institutions must have the freedom, where possible, to reduce spending on instruction and wages and to bank surpluses from year to year in order to accumulate funds for construction and acquisition of laboratory and workshop equipment. Private institutions have this freedom, but public ones do not. Instead, budget rules appear to incentivize spending of all funds received within the same budget year and keep expenditure centred as firmly as possible on wages or other approved expenditures as opposed to innovations that require institutions to accumulate savings overtime.

Improved freedom on management of resources should go along with improved measures for good governance and accountability. The current requirement to spend all money within the current budget year has the virtue of permitting the Ministry to keep very close tabs on spending within institutions and ensure that public funds are being used for public purposes. The Ministry may, for reasons of this nature, be reluctant to sanction spending freedom of public universities. However, there are other ways to keep institutions accountable. Institutions can be required to submit accounts to Parliament’s Public Accounts Committee, and senior administrators can be required to give evidence annually to provide answers to any questions about the use of funds. Provided regulations on budget transparency are put in place, removing restrictions on institutions’ ability to carry funds forward from year-to-year need have no adverse effect on government’s ability to execute its responsibilities with respect to the proper oversight of public money.

- *Focus on Outcomes , Not Inputs and Outputs*

The purpose of institutions is not simply to admit students; it is to provide them with a quality education, and graduate them into meaningful employment, and this should be the focus rather than inputs. Merely ensuring the provision of sufficient classroom space and the presence of a number of professors with advanced qualifications does not guarantee that learning commensurate with a “quality education” is taking place and does not ensure that training is sufficiently relevant for graduates to enter paid employment after their studies.

Across the system in Ugandan higher education, there is a high degree of concern with inputs. The wage budget takes into account the number of professors employed; the non-wage budget takes into account the number of scholarships awarded. There are no financial rewards for outcomes. Similarly, when the NCHE looks at indicators of quality, it looks at inputs – space, professors, books and computers.

By so doing, both the government and the NCHE have perhaps inadvertently kept the debate about Ugandan higher education focussed firmly on the resources required to purchase these inputs. Undeniably, the resource issue is hugely important. However, by focussing *solely* on

inputs, and on particular kinds of inputs⁷, the more important outputs of institutions are neglected.

With the NCHE now issuing fairly detailed national curriculum standards in different disciplines, national matriculation examinations in each subject are possible and could provide important information about comparative learning outcomes across institutions. An expanded and regularly conducted National Tracer Survey could provide key data about employment rates and graduate satisfaction at the institutional level if not the program level and funding could be tied to these outcomes, if desired, as has been done in Australia. Similarly, if it was more scientific research that was desired as an output, then publication and/or citation of research papers in selected journals would be a useful metric to monitor, publish, and – if so desired – funded, as is currently the case in Chile and Norway.

This is not to say that the measurement of inputs should be ignored; rather that these inputs can only become meaningful when they are complemented with measures of outputs. The key difficulty, of course, is resources: inputs are undeniably much easier to count than outputs. Output measurements such as tracer studies cost money, but in the end it is money very well spent, particularly if institutions are to be given more freedom in budgeting. Data from output measurement can then be used as another way to determine if institutions are using their budget freedom in ways that improve results.

It should go without saying that any system of improved measuring and reporting of institutional activities and outcomes will require substantial investments by institutions themselves in their ability to capture and report data. The NCHE has made significant strides with institutions through the creation of an annual set of surveys that has forced institutions to collect data more diligently, but there is still far to go. The cost for these upgrades will need to be borne by institutions themselves – a fair trade-off, though, for access to increased funding and increased budgetary flexibility.

- *Incentives to produce graduates in science-related disciplines*

Providing institutions with bonuses for each student that graduates in a science or engineering program would provide an incentive for institutions to invest in science and technology programs. Uganda needs science-based graduates, and institutions won't produce them unless their costs are covered. Much of the new money in higher education therefore needs to be directed towards incentives to this end. Providing institutions – both public and private - with a set amount of money for each graduate in a science-based program is an excellent way to focus institutional attention in the desired direction. Though they are not used to steer institutional policy in quite this way, similar types of output-based funding models are currently in operation in the Czech Republic, Finland and the Netherlands. The objection to such a course

⁷ NCHE collects and publishes data on six sets of input ratios: staff-student ratios, library space/student, lab space/student, lecture space/student, computers/student and books/student.

of action is that it provides an incentive for institutions to lower their standards: by paying on the basis of degrees awarded, institutions might have an incentive to pass weak students that they would otherwise have failed. However, the National Council of Higher Education now functioning as a quality control agent in the manner envisaged by its 2001 enabling legislation, there should be sufficient controls in place with respect to quality to ensure that institutions do not “game” the system by granting weak science-based degrees.

If the Government of Uganda is committed to substantially increasing the number of science and technology graduates, then this kind of funding policy is precisely the kind of step it needs to take. Tilting the incentives towards sciences on this kind of scale should give plenty of impetus within institutions to readjust their hiring and enrolment in a manner that more closely meets government objectives and – moreover – ensures that a larger amount of funds goes to those institutions that are most diligent about meeting these objectives. This is the enormous advantage of basing funding on outputs and outcomes rather than by trying to manipulate inputs directly.

Finally, to ensure the broadest possible uptake in efforts to improve science capacity, funds from a new science graduate incentive fund should be offered not only to public institutions, but to private ones as well. For the purposes of priming economic growth, it should not matter in what sector a graduate earned their degree – provided the degree meets the standards set by the NCHE, the institutions providing it should receive the graduation bonus. If Busitema University and Kampala International University were both to graduate 100 science graduates a year, they would both be eligible to receive 800 million shillings to reinvest in their educational programs. This would not be quite the same as a voucher system (which reward enrolments rather than graduations), but many of the principles would be the same; money would follow graduates regardless of the institution attended, provided that institution met NCHE standards.

- *Providing loan guarantees for construction*

A concerted program to help institutions renew their infrastructure can help relieve some of the most obvious systemic bottlenecks to increasing access. It has already been noted that possessing good physical infrastructure can significantly lower the marginal cost of educating a student; yet infrastructure is among Ugandan higher education’s weakest points. The provisions around increased formula funding and increased budget autonomy (outlined above) should give institutions the ability to plan on a multi-year basis and to save their capital for future investment. But requiring institutions to save the full costs of construction prior to beginning construction will mean lengthy delays in addressing the bottleneck, even if all the other recommendations in this report are adopted immediately. But investment need not be solely about saving – it can also be achieved through borrowing.

Using borrowing to speed up the construction is not without its drawbacks. Among other things, many institutions may have trouble finding financing for their loans and be required to pay substantial interest premiums if they can find a lender at all. But if the Government of Uganda – perhaps in partnership with an international lender such as the International Finance Corporation – could guarantee the loan, then institutions might find it easier to raise funds. The guarantor(s) could also demand a flat fee (perhaps 2% of the total cost of the loan, backed by a portion of annual tuition revenues) as compensation for the assumed risk. The Government of Uganda has already benefitted from one such guaranteed loan made in 2008; provided that sufficient arrangements are made to protect the public purse from the risk of default, there is no reason why all institutions - both private and public - should not be able to benefit from such a facility.

Improving Research Funding within a Clear Government-Wide S&T framework

Need for more funding and better coordinating between respective institutions and universities. Uganda's national innovation system is somewhat truncated, running only between individual ministries and industries, instead of spreading out to include institutions whose mandate includes basic research. As Uganda transitions from Poverty Eradication to Development, it will be imperative for the Ugandan science community to play a greater role in on-going international scientific conversations and to join the networks of knowledge that lead to real innovation and productivity increases. That means providing that universities have to obtain real research funding – funding which for the moment is largely absent.

This is not to say that Uganda has underperformed in terms of investing in research, science and technology. It has an impressive array of organizations, all under the aegis of the National Council of Science and Technology, which conduct research of a highly practical nature, often in areas related to agriculture, fisheries and other natural resources. These organizations support a reasonably-sized domestic community of scientists; indeed, 80% of all scientists work in the public or para-public sectors.

There are two striking things about the Ugandan scientific community, however. The first is the degree to which it is divorced from the higher education sector, and the second is the degree to which it is beholden to a number of different ministerial masters. In many countries, science and technology ministries work hand in hand with ministers of education; indeed, in some places, education science and technology are all part of the same ministry. In Uganda, there is no science and technology ministry and money for individual research institutes comes through individual ministries (the National Agricultural Research Organisation, for instance, receives funding directly from the Ministry of Agriculture).

While emphasising applied research at the expense of teaching and theoretical research may deliver good returns in the short-term, in the long-run this strategy is ultimately harmful. Unlike university research, the applied research provides no spin-off benefits in terms of providing new

graduate students, who are the base of human capital on which the next generation of researchers will be built. Already, some institutes report that the underinvestment in science at the university level is eroding the quality of graduates and forcing them to provide remedial training for their new hires. Closer collaboration between the two sectors, as well as a more equitable balance of research funding between the two could pay significant dividends in terms of the quality of future researchers and integration of research findings in the university training programmes/using findings to inform the design and/or improvement of university training programmes. Moreover, as Uganda develops, there will be an ever greater need for a more expansive system of national innovation. There are few if any successful systems of innovation which do not include universities in the basic research they perform. Failure to incorporate universities in this system will, over the long run, hinder the country's ability to develop along a higher-wage path.

While a re-organization of general science and technology policies are to be desired, they are not sufficient. Research and access to research funds are the lifeblood of top academics; without a pool of competitive research grants in Uganda, the problem of brain drain will continue (since the real coin of academia is professional reputation and prestige, academics are often quite content to trade-off lower salaries for access to research funding). Uganda already has an adequate working model of such a competitive grants system in the Millennium Science Initiative (MSI) which is being run by the Uganda National Council on Science and Technology. However, the funds in the MSI come from international donors (the World Bank) and are not unlimited – in fact, the funds are due to run out after five years. It would therefore be ideal if the Government of Uganda were to take \$12 billion of the proposed 125 bn shilling increase in funding and use it to continue funding the research grants section of the MSI.

Policy Goal II – Increase Access to Higher Education

How financial instruments can be used to increase opportunity. The correct mix of programs to widen access would involve grants to those from very poor backgrounds and loans to both the poor and some of the slightly better-off students, to ease liquidity constraints. The Government of Uganda has a laudable goal across all of its development programs to lessen income inequality. In higher education, the priority is therefore that there should be a widening of opportunity to include more students from poorer backgrounds.

There are, broadly speaking, three broad reasons why youth do not end up in post-secondary education. In Uganda, the most common reason is simply that so few youth actually have the necessary qualifications to attend. Many have not finished primary school, let alone secondary; as a result they have what could be called an “academic barrier”. Another group of students finish secondary school but for whatever reason have no interest in continuing their education; this group has what might be called a “motivational barrier”. A final group wishes to attend

tertiary education and has the academic credentials to do so, but cannot or will not pay the amounts required to study for three years. This group has a “financial barrier”.

But not all “financial barriers” are created equal. Some people recognize the utility of a degree, believe it to be a good deal that will pay themselves positive returns in the long run despite the cost, but cannot scrape the money together in the short term. These people are “liquidity-constrained”. For these students, the proper instrument to help them is a loan, which relieves them of their liquidity constraint in the short-term, and – provided a relatively successful repayment system is in place – is much cheaper to provide than a grant.

However, this is not the only possible financial barrier. Consider people who desire an education for its own sake, but believe that at current tuition prices, the investment cannot be justified. Note that it does not matter whether it can be justified in actual fact - what matters here is the *perception* of the cost-benefit ratio, which, for a variety of reasons, may be weaker among youth from poorer families than among youth from richer families (see Usher 2006). Or, take students who, for whatever reason, do not want to take out an interest-bearing loan (which may be the case, for example, with very poor students whose families may have had bad experiences with predatory lenders). Loans cannot be of service in inducing these students to attend – only grants (sometimes called bursaries) can do that.

In theory, this is simple enough. In practice, targeting student aid programs accurately can be difficult, even in developed countries where student aid programs have access to considerably more financial information and computing power than is likely to be the case in Uganda.

Reforming Student Financing/aid

- *Reforming the current Grants/Bursaries*

As many previous studies have shown, recipients of current grants and bursaries are overwhelmingly from wealthier families and whose academic prowess can in some part be explained by the fact that they have benefitted from being educated in “first world” secondary schools. Though it is not often described in such a manner, Uganda does have a system of student grants. The term “grants”, after all, simply denotes a payment designed to offset tuition fees –and this is precisely what happens for the 4000 new “government-sponsored” students admitted each year to Ugandan universities under what amounts to a merit-based scholarship. True, no money changes hands with the student (government pays institutions a fixed amount in return for permitting a fixed number of students free of charge), but it is still effectively a bursary.⁸

⁸ For greater clarity, the terms bursary and grant are used interchangeably as simply indicative of a payment designed to reduce a student’s net cost of education. Normally, in student aid parlance, these terms are used to

But it is important to ask: what is being incentivized by these payments? Despite the fact that it is stated government policy to broaden access to higher education for students from poorer backgrounds, the country's sole form of student aid in practice tends to end up in the hands of students whose parents are wealthy enough to send them to secondary school with fees higher than those charged in university. Simply put, the wrong people are getting this money, and are reaping windfall gains while the core of the policy problem (how to get bright but needy students into higher education) remains unsolved.

While there is an urgent need to re-direct the scholarship money to directly assist the poor, there is a challenge in delivering aid this way: namely, that the Ugandan government has very little experience in running programs which deliver aid based on identified need. Though things like parental income are measurable if parents work in the formal economy, these people are still a minority in Uganda (though they are likely a substantial majority among parents of students in universities). As a result, it is probably a better idea if the need criteria were represented by a proxy for having very low income – such as having attended a secondary school in a rural district, or attending Universal Secondary Education schools. Something like this has already occurred in Uganda's secondary school system through the award of scholarships to bright but needy students whose parents live in IDP camps in the country's northern and eastern regions. This same idea could be applied more broadly, perhaps identifying specific regions or communities based on verifiable external attributes that are caught by the census or other regular social surveys such as average income, caloric intake/nutrition, etc. This was essentially what the Government of Indonesia did when it set up a national scholarship program in the aftermath of the 1998 financial crisis.

While it is important for equity reasons that non-repayable assistance have a need component, this does not mean that need has to be the only criteria for the awards. Grants could still contain a merit component (i.e. academic results could still be used as a rationing mechanism if demand for grants exceeded supply). It could also, if desired, still carry a requirement to study in a particular field (since 2005/06 there has been a stipulation that 70% of scholars must study in a science-based faculty) but they would remain restricted to a particular group of people who are designated as “high need”.

The cost of providing recipients with full tuition waivers increases as tuition increases. As a planning assumption, we assume here that the number of bursaries will remain the same (4000 per intake year or roughly 12,000 total in any given year) and that the average cost of tuition will be approximately 2 million shillings per year. That implies program costs of something on the order of 25 Bn US\$ per year. Of this, 10 Bn should be taken from the system of existing

describe money which is distributed principally on the basis of assessed need or family income. This is contrasted with the term “scholarship”, which is also a payment designed to reduce net student costs, but which carries the connotation of being awarded on the basis of academic merit, not need.

funding (i.e. the 100 Bn shillings which under this plan are to be devoted to formula funding) and the remainder coming from the 125 Bn in extra public funding recommended previously.

- *Introducing a Student Loan Scheme*

Introducing a student loan scheme would help to defray students’ financial costs. However, these involve substantial costs and require very careful design of eligibility criteria, loan amount, locus of responsibility, distribution of risk, repayment period, collection etc. Student loan schemes are frequently touted as being a relatively costless way to expand higher education. With loans, it is often said, tuition can rise and institutions will get access to more private money. Since it is a loan and not a grant, it is commonly assumed that the cost of the loan will be repaid, thus making it a relatively risk-free and indeed even cost-free enterprise.

This view is wrong. Student loan schemes always involve substantial costs, Indeed, in most African countries, it costs governments well over fifty cents to loan a single dollar, partially due to the costs of non-repayment of loans, but partly because expensive subsidies are often built into the loans and which act as “hidden grants”. Table 8 reviews African data from Ziderman and Hua (2008), which looks at the real costs of student aid programs.

Table 8 – Summary Statistics on African Student Loan Programs

	Hidden grant as a percentage of total loan value	Losses from defaults as a percentage of loan value after hidden grants	Repayment Ratio, incorporating hidden grants and defaults
Egypt	88.05	n/a	n/a
Ethiopia	64.76	29.99	24.67
Ghana	60.87	71.99	10.96
Kenya	72.07	79.99	5.59
Mauritius	40.64	5.54	56.07
Namibia	0.21	n/a	n/a
Nigeria	89.12	n/a	n/a
South Africa	49.53	29.01	35.83

Source: Ziderman and Hua (2008)

What table 8 shows is that extreme care has to be taken in the design phase of a student loan program to ensure that costs can be controlled. Of the five countries for which full data is

available, four have repayment ratios of less than 40% and at the extreme (Kenya) the loan repayment ratio is just over 5% (that is to say that 95% of every dollar loaned is lost via hidden subsidies or loan default). Of the eight African countries listed, only Namibia has managed to keep its loan system from losing large sums of money through subsidization and only Mauritius has been able to keep the cost of loan defaults low. Of the rest, Ethiopia and South Africa have loan loss rates that would be considered acceptable (if not brilliant) in developed countries, but still have very low repayment ratios because of the generosity of their hidden subsidies.

Government costs in student loan schemes are dependent on the kinds of policy design choices that need to be made at the outset of the process. Among the most key design choices are:

- *Eligibility criteria:* In some countries, all students are eligible to borrow. In others, eligibility is restricted in some way, either by the type of institution (will all student be eligible or just those at public universities?) or type of student (many countries do not permit part-time students to borrow, for instance), or, more typically, via an income or need test. If eligibility is to be restricted by family income, how is family income to be measured?
- *Loan Maxima:* What should the maximum loan size be? Should it cover tuition and living expenses? Just tuition? Just a portion of tuition? A more expansive definition here might improve access – but it will also certainly increase portfolio risk and hence cost.
- *The locus of responsibility for assessing eligibility and need?* Is this program to be centrally administered, or administered decentrally at the institutional level? Will it be government taking the lead, or will it be institutions? Or might a third-party such as a financial institution be contracted to do this on a fee-for-service basis?
- *The nature of the payee.* If the loan is strictly for tuition, the loan cheque can be made payable to the institution rather than the individual; if the loan is meant for personal expenses as well, then some arrangement will need to be made for paying individuals, too.
- *The distribution of risk and the presence of guarantees (either from governments, parents, or others).* Human capital loans, because they are advanced without collateral, almost always require some form of guarantee in order that the lender not assume 100% of the risk associated with the loan. In some countries, parents are asked to co-sign the loans as a form of guarantee (which in effect makes it a family loan rather than a student loan). In other countries, government assumes the entire risk. But other structures are possible. In China, banks assume the risk, but are paid a fraction of the loan value as a way of compensation for taking on the risk. In a recent small project in Indonesia, the International Finance Corporation has worked with the government of that country to share the risk out (risk is “tranching” between partners) and reduce the exposure of any one partner.

- *The source of initial capital.* In some systems, the loan money comes straight from government coffers. In many guaranteed loan systems, it is a commercial bank which originates the loan – and is happy to do so because the principal is guaranteed.
- *The nature (if any) of any subsidies provided during the life of the loans.* This is a particularly thorny issue in a high-inflation environment such as Uganda's. Should interest on the loan be subsidized or not? For how long? During school or all the way through the life of the loan? At 15% annual inflation and borrowing rates at 17-20%, these subsidies could add up very quickly. But if no subsidy is given, then student debt will also increase quickly: A student borrowing 2 million shillings a year at 15% interest will find herself nearly 8 million shillings in debt by the time she is finished her studies.
- *The grace period permitted before loans are required to be repaid.* Most students take time to find work after graduation. That is why most loan systems provide for some form of grace period after studies during which no payments are required. But how long? Six months? A year?
- *The locus of responsibility for overseeing loan collection.* This poses a set of questions similar to the ones with respect to eligibility: who is actually responsible for tracking borrowers and ensuring that they are making payments? Locating people is much harder in developing countries than in developed ones. However, the creation of a national credit bureau in Uganda in December 2008 may make this task substantially easier,
- *The length of the repayment period.* Shorter periods of loan repayment mean less risk for the lender; however, they can also mean misery for the borrower. Imagine a student with a 6 million shilling loan asked to pay back the full amount with interest in five years. If he was making 500,000 shillings a month before tax (i.e. not far below the national average for new graduates) , how realistic would it be for him to be paying the necessary 150,000 shillings a month (i.e. 30% of pre-tax income) in loan repayment? A balance has to be struck here: in general, the larger the loan, the longer the necessary period of repayment.

It is not the purpose of this paper to answer all of these design questions: these will need to be worked out by government, institutions and hopefully student groups working together in a spirit of partnership. But the basic requirements of a loan system for Uganda are fairly clear. . Students (or their parents) should be able to borrow the full value of tuition under the loans, so that no financial barrier to higher education exists. In order to keep the program affordable to government, hidden grants need to be kept to a minimum. Ideally, market or near-market rates of interest would be charged; but under no circumstances should the rate of interest fall below the rate of inflation. Finally, and perhaps most importantly, great care must be paid to the issue of collections and repayment. The experiences of South Africa and Mauritius in particular need to be examined carefully to see how defaults were minimised. If collections are not made rigorous from the very start, defaults will rise and the costs of the loan program will rise quickly and reduce the amount of funds available to expand and improve higher education.

Even if all of this advice is followed, a strong student loan program is unlikely to be cheap. To give a sense of the scale of the required enterprise, assume the following:

- That no real interest will be charged on the loans, but the value of the loan will be linked to inflation, for the life of the loan.
- That loans are limited to the value of tuition (which, as we recall, will increase by roughly 50% in this plan)
- That 30% of the student body avail themselves of these loans.
- That half borrow the full amount available while the other avail themselves of half that amount
- That no more than 25% of the value of the loans will be lost due to non-payment (a result that would be excellent by African standards)
- That the loan shall be repaid in 10 years

In that case, the total take up each year would be just over 50Bn Ushs and losses on each loan issued will equal about 50% (roughly evenly split between the value of the loan subsidy and the loan losses). Thus, in addition to whatever administration costs are incurred, the government would need to set aside 25bn UShs as provision for future loan losses. 30 Bn would therefore be a nice round estimate for the cost of the program. But, of course, costs could change significantly if the mix of subsidies were changed and/or the program experiences a substantially different take-up rate, if design features like the loan maxima or the length of the repayment period are changed, or if assumptions about the efficacy of loan collection procedures is changed..

Such a student loan program – which would not be especially generous by international standards - is certainly not cheap. But it is money well spent if it permits institutions to charge reasonable fees in the range of 125 Bn Ushs as projected above.

Conclusion

Uganda has an excellent recent record in terms of expanding its system of higher education – in fact, it would now appear to be among the continent's better performers in terms of access. What is needed is to improve the quality of education, to re-orient the system so as to make it more science-focused, to provide extra funds for research, to make facilities available for the improvement of infrastructure, to provide more institutional freedom in budgeting, and to create a working system of student financial assistance to ensure that all students capable of benefitting from higher education are not barred from doing so on grounds of finances.

In Part II of this document, some specific policy solutions to increase institutional funding were suggested. Based on a combination of rising tuition, increase in educational budgets (already

planned) and a small rise in the tertiary education sector's share of the total budget, suggestions have been made for additional resources

Suggestions were also made with respect to the disposition of these funds. They included:

- A conversion from annually-negotiated funding sum to a formula-derived grant with fewer restrictions as to the disposition of the cash.
- A new fund to institutions on the basis of science degrees awarded, thus creating a major incentive for institutions to orient their curricula towards science-based programs. NCHE monitoring of quality standards will be key to making this work.
- A fund for research, to continue the work of the competitive grants portion of the Millennium Science Initiative once donor funding runs out
- Student financial assistance, with roughly half going to a new system of grants and half going to service a new student loan fund.

There is also need for more flexible funding, outcomes- and incentive-focussed and in which financial barriers to attending higher education will have been lessened. In short, it is the kind of package that will greatly improve higher education in Uganda and possibly allow it to reclaim the leadership position in African higher education that it lost during its years of political violence.

Table 1 Annex – Enrolment by Institutions: Uganda (2006)

Public Universities	
Makerere University	31081
Mbarara University of Science and Technology	1790
Kyambogo University	10566
Gulu University	1837
Makerere Univesity Business School	10731
Public Universities TOTAL	56005
Private Universities	
Uganda Martyrs' University	2557
Uganda Christian University	3012
Islamic University in Uganda	2468
Kampala International University	13938
Aga Khan University	143
Bugema University	1245
Nkumba University	4453
Ndejje University	2164
Busoga University	1119
Kabale University	291
Kampala University	600
Kumi University	751
Mountains of the Moon University	294
Bishop Stuart University	1406
Uganda Pentecostal University	199
Central Buganda University*	187
Fairland Univesity	821
Luwero University*	47
Nile University*	218
Bishop Barham University College	687
Private Universities TOTAL	36600
UNIVERSITIES Total	92605
Teachers Colleges	10997
Technical colleges	1980
Health Colleges	3132
Management/Social Development Institutions	4156
Commerce/Business Colleges	18181
Theological colleges	1098
Other colleges and study centres	5041
TOTAL TERTIARY ENROLMENT	136728

Source: National Council on Higher Education Annual Report 2006.