ECONOMIC RESEARCH FORUM
منتدى البحوث الاقتصادية
2010

working paper series

FINANCING HIGHER EDUCATION IN TUNISIA

Tahar Abdessalem

Working Paper No. 551

FINANCING HIGHER EDUCATION IN TUNISIA

Tahar Abdessalem

Working Paper 551

October 2010

I am grateful to referees for helpful comments and suggestions. I also wish to thank the participants in the Regional Conference on Financing Higher Education in Arab Countries, which was held by ERF in Amman, June 2009, for interesting discussions and comments.

Send correspondence to:
Tahar Abdessalem
Ecole Polytechnique, Tunisia
Email: tabdessalem2@yahoo.fr

First published in 2010 by
The Economic Research Forum (ERF)
7 Boulos Hanna Street
Dokki, Cairo
Egypt
www.erf.org.eg

Abstract

This paper focuses on Tunisia, which like other developing countries, has allocated increasing levels of resources to education, particularly higher education, mainly through public funding over the past few decades. In 2005-2008, public expenditure on education amounted to around 7.4 percent of GDP, with 2 percent allocated to higher education. However, in the last few years, the budgetary constraints have increased, and are likely to remain so in the near future. These budgetary constraints exist within a context of rapidly increasing student enrollment, and the need to improve the quality of education to insure better employability of graduates. In light of this situation, public policy is obliged to define orientations and programs, improving quality and efficiency while reducing costs and resource wastage, to enhance access and equity. This paper is organized as follows: it begins with an assessment of public expenditure on higher education in Tunisia, with respect to its adequacy, efficiency and equity. Next, in section 2, we explore the challenges posed to financing by demographic evolution, the quality of education and private provision. Section 3 examines some financing reinforcement strategies, and analyzes feasible measures to raise private funding contributions. Section 4 provides some concluding remarks.

ملخص

تركز هذه الورقة علي أن تونس، مثل باقي الدول النامية، قد خصصت خلال العقود القليلة الماضية قدرا كبيرا من مواردها للتعليم، وخاصة التعليم العالي، معتمدة في ذلك بشكل أساسي علي التمويل العام. في عام 2005-2008، بلغ الإنفاق علي التعليم نحو 7.4% من إجمالي الناتج المحلي، منها 2% خصصت للتعليم العالي. لكن خلال السنوات القليلة الماضية، ذادت قيود الميزانية ويبدو أنها سوف تستمر كذلك علي الأقل في المستقبل القريب. و قد جاءت تلك القيود بالميزانية وسط التحاق متزايد من قبل الطلاب، بالإضافة إلي الحاجة إلي تحسين جودة التعليم من اجل ضمان فرص توظيف أفضل للخريجين . في ضوء هذا الموقف، فان السياسة العامة مضطرة أن تحدد برامج و توجهات تكون قادرة علي رفع الجودة و الكفاءة بأقل التكاليف و اقل إهدار للموارد من اجل تعزيز إتاحة فرص التعلم للجميع و العدالة في ذلك . هذه الورقة نظمت كما يلي: فقد بدأت بتقييم الإنفاق العام علي التعليم العالي في تونس، من حيث الملائمة و الكفاءة و العدالة. في القسم الثاني: دراسة التحديات المطروحة للتمويل من خلال التقييم الديمغرافي للسكان و جودة التعليم و الاعتمادات الخاصة . في القسم الثالث: دراسة بعض استراتيجيات تعزيز التمويل بالإضافة إلي دراسة إجراءات عملية من أجل رفع مساهمات التمويل الخاص. و في القسم الرابع: نقوم بتسجيل ملاحظات ختامية.

Introduction

Economists have consistently emphasized the major role played by education in enhancing economic growth and development. Beyond its traditional role of providing skills for economic growth, education represents a powerful tool to potentially achieve social development, for example, by reducing inequalities and improving health and other living conditions. Perhaps for these reasons, the economic analysis of education has been extensive, ranging from featuring in endogenous growth models (e.g. Lucas, 1988; Romer, 1990) to microeconomic analyses of the outcomes of education through the measurement of the rates of return to investment in education.

Throughout, the issue of the government's role in provisioning and financing education has been paramount and stimulated much debate. Some economists favor mixed financing systems (e.g., Glomm and Ravikumar, 1992); others advocate public subsidies (Fernandez and Rogerson, 1995, 1999; Zhang, 1996); and some favor vouchers (Chen, 2005; Benos, 2007; Cardack, 2005).

On grounds of societal well being, the traditional arguments in favor of public financing are:

- imperfect financial markets and the severe restriction of credit for human capital unless supported by substantial dedicated savings and assets,
- positive externalities generated by education that are beneficial to students as well as the whole society,
- asymmetric information, where the less educated parents are less informed of effects and benefits of education,
- income distribution inequalities calling for government intervention to enhance the access of the poor to education.

In line with the human capital theory, Abdessalem, Gurgand and Lévy-Garboua (1998) gave an interpretation of the rationale for public financing as an implicit loan from the parents' generation, paying taxes, to the generation of children who will pay back this debt through their own taxes. By investing in individual education, the State assists in the generation of future incomes consisting of additional taxes paid by educated individuals. This action allows agents, who would otherwise have been constrained by poor financial conditions, to invest optimally in education. This "social contract" leads to the quasi-free education observed in many countries. Still within a normative framework, but considering higher education as a public good, Abdessalem (1997), presented a mixed decentralized system combining private contribution (through appropriate pricing) and public incentives consistent with government financial constraints.

Notwithstanding these views, public spending on education, especially on higher education, raises questions with respect to the quality of outcomes, equity of access, and the possibility that public financing is the solution to expanding enrollment. For example Pritchett (2001) underscores the point that public expenditure on education doesn't always lead to better quality and may even impact economic growth negatively. The World Bank Report (2008) argues that despite the tremendous efforts in the MENA region to expand access to education and accumulate human capital, education systems in the region "are not ready to face the new economic, demographic and financial challenges".

Against this background, this chapter focuses on Tunisia, which like other developing countries, has allocated increasing levels of resources to education, particularly higher education, mainly through public funding, over the past few decades. During 2005–2008, public expenditure on education amounted to around 7.4 percent of GDP, with 2 percent allocated to higher education. However, in the last few years, the budgetary constraints have

increased, and are likely to remain so in the near future. These budgetary constraints exist within a context of rapidly increasing student enrollment (at an average annual rate of 9 percent between 2000 and 2008), and the need to improve the quality of education to ensure better employability of graduates. In light of this situation, public policy is obliged to define orientations and programs, improving quality and efficiency while reducing costs and resource wastage, to enhance access and equity.

The chapter is organized as follows. It begins with an assessment of public expenditure on higher education in Tunisia, with respect to its adequacy, efficiency and equity. Next, in Section 2, we explore the challenges of financing by demographic evolution, the quality of education and private provisions. Section 3 examines some financing reinforcement strategies, and analyzes feasible measures to raise private funding contributions. Section 4 provides some concluding remarks.

1. Adequacy, Efficiency and Equity in Financing Higher Education

This section assesses expenditure on higher education in Tunisia on the basis of the criteria of adequacy, efficiency and equity of this spending. Most of the analysis is based on public expenditure, but an attempt is made to capture private spending by drawing on available data from household surveys as well as private provisions for higher education. The analysis is also carried out comparatively, placing Tunisia against a set of comparator countries as far as data permits.

1.1 Adequacy

Overall total government expenditure on all levels if education in Tunisia has been around 7.4 percent of GDP in recent years (table 1). This figure is more than the OECD (2004) average of 5.8 percent and the 5.3 percent average for lower middle income countries[1] (OECD, Education at a Glance, 2007, UNESCO-UIS 2007 and Edstats database, 2007). As a percentage of public expenditure, the trend of these recent years is an increasing one reaching 22 percent in 2006, and 23 percent in 2008, which is far above the corresponding percentage for the OECD (12.6 percent) and the lower middle income countries (15.3 percent) (OECD, Education at a Glance, 2007, UNESCO-UIS 2007)

Public expenditure on higher education in Tunisia has stabilized recently at the level of 2 percent of GDP (figure 1). This figure is higher than the corresponding averages for the OECD countries (OECD, Education at a Glance, 2007, UNESCO-UIS 2007) as well as lower middle-income countries[2] (UNESCO, Global Education Digest, 2007), with percentages of GDP of 1.4 and 1.0 on average respectively. As for the share of public expenditure on higher education relative to public spending on all levels of education, it has also consistently increased from 21 percent in 2000 to almost 28 percent in 2008. Thus, according to the information obtained from Edstats database and reported in Figure 1, such expenditure was comparable to OECD countries in 2000 and 2002, but Tunisia outspent the lower middle income countries in 2000 and 2002 and both sets of countries in 2004.

On a trend basis, public expenditure on higher education in Tunisia has been increasing steadily relative to GDP, relative to total public expenditure on education and relative to total public expenditure (figure 2). However, this trend has slowed down in the last few years.

The public sector remains dominant in the provision of higher education. The number of registered students in private higher education institutions in Tunisia increased from 3,500 in 2004 to about 6,000 in 2008, with a percentage of all students enrolled in higher education

[1] Data on OECD and Lower Middle Income countries averages are for 2004.

[2] Taking 2005 instead of 2006.

institutions rising from 1.1 to 1.7 in the same period.[3] Also, while the number of private faculties increased from 20 to 30 faculties between 2004 and 2008, the number of public faculties increased from 150 to 190 during the same period.[4] Similarly, student enrollment in public institutions grew from 300,000 to 350,000. As a result, the share of student enrollment in private higher education in Tunisia stands far below that of the lower middle income and OECD countries (Table 2).

Little is known about the contribution of households to public higher education. Most surveys focus on pre-university education. However, surveys among students to capture information about their expenditures and sources of funding do provide some insights.[5] Private contribution to current higher education expenditures in the public sector can thus be estimated as 4.3 and 5.9 percent respectively in 1997 and 2004. If the same trend continues, it would be around 5.7 percent in 2008. This contribution remains very small. Taking into account private institutions of higher education, we can estimate that the overall private contribution to funding higher education is about 6 percent, 1.7 percent for private provision and 4.3 percent for private financing in the public sector. These proportions are much lower than OECD averages where the share of private sources was 24.3 percent in 2004, growing from 20 percent in 1995 and 22.4 percent in 2000 (OECD, Education at a Glance, 2007).

In terms of US$ PPP, in 2005, the expenditure per student in higher education in Tunisia was much greater than in lower middle income countries and around half of OECD countries' expenditure (Table 3).

In summary, we can say that the government bears the bulk of higher education funding. Private provision of higher education remains modest and so does the contribution of households to the funding of public education.

1.2 Efficiency of spending

1.2.1 Internal efficiency

Internal efficiency is intended to capture the cost effectiveness of the supply of education. As effective institutions require adequate combinations of fixed assets, facilities, skilled personnel and other infrastructure for a good learning environment, internal efficiency can be assessed using such indicators as the pattern of allocations between current and capital expenditure, expenditures on academic and non-academic staff, student-teacher ratios, etc.

During the last decade, the trend in the distribution of public spending on higher education has shown a slight increase in capital compared to current expenditure, with the former rising from about 20 percent in 1998–1999 to stabilize around 25 percent in recent years (figure 3). As capital expenditure includes purchasing assets, the maintenance and updating of infrastructure, this evolution seems to be favorable in terms of the quality of learning infrastructure and thus to the efficiency of the system. As for current expenditure, wages represent around 70 percent of the total. The balance is distributed between operating expenditures of institutions, grants, subsidies and student loans.

In 2002, staff of public higher education was made of 64 percent teaching staff and 36 percent non-teaching staff (administration, technical, and auxiliaries). For the same year, teaching staff benefitted from 46 percent of current expenditure and 22 percent for non-teaching staff.[6] These indicators emphasize the importance of resource allocation to a greater input of higher education production, i.e. the faculty members.

[3] Data from Ministry of Higher Education.

[4] Idem.

[5] Higher Education Financing Studies, Tunisia, Ministry of Higher Education 1997 and 2004.

[6] World Bank, Tunisia, Sector Policy Paper on Higher Education Financing, 2004.

Indeed, we observe some parallelism between current higher education expenditure evolution and the trend of teaching staff during the last decade: an average increase rate of 12.5 percent for the former and about 9 percent for the latter. Taking into account unit wages average raises in this period, the rhythm of evolution would be quite close. However, some disparities within the teaching staff structure may affect the efficiency of resource allocation (table A6, Appendix). It is worth noting that 45 percent of the teaching staff is composed of "non-standard" faculty members. They are either young undergraduates writing a thesis and benefitting from a contract as teaching assistants, secondary education teachers put at higher education's disposal (particularly for language courses) or engineers employed for technical activities. The increase in these categories of academics has been the most rapid in the past few years due to the pressures of growing enrollment coupled with government budgetary constraints. Only about 9 percent of the teaching staff comprises professors, another factor that probably contributes to the low internal efficiency.

Another indicator of efficiency/inefficiency in higher education is the class student-teacher ratio. This indicator reflects the learning environment and the incentives to attend courses, be interested, acquire knowledge and upgrade students' skills. Table A9 of the appendix shows that despite the slight improvement of this ratio during the last decade (less than 19 students per teacher in 2007 and 2008), we observe that, in 2005, Tunisia had a much higher students-teacher ratio of 1:19.4 compared to lower middle income countries' OECD average, and the world, but lower than MENA countries' average (figure 4).

It is then quite obvious that in order to get closer to international standards for the teaching staff, public allocation of funds should take a dual path: increasing expenditure for the existing teaching staff and recruiting more faculty members, and improving the composition of this staff by lowering the proportion of non-professors and raising that of full professors.

1.2.2 External efficiency

We could not find recent estimates of the rates of return to higher education in Tunisia. Only two estimates are available. The first dates back to 1980 (Psacharopoulos, 1994, recalled in Psacharopoulos and Patrinos, 2002) concerning the private returns to education, estimated at 13 percent for secondary and 27 percent for higher education. The other is the World Bank Report (2008), which records private rates of return to university education in 2001 at 10.1 percent for males and 10.5 percent for females.

According to this evidence, it appears that private rates of return to higher education in Tunisia are consistently higher than both primary and secondary education (table 4). There seems to be a direct correlation between the rate of return and increasing educational levels. In particular, the weak returns to the primary and secondary cycles are corroborated by data on average wages in public administration included in Table 5.

Another indicator of external inefficiency is the distribution of unemployment by level of education, which is shown for Tunisia in Table 6 for the years 2000–2007. It appears that present unemployment increases with educational level, the lowest being for illiterates and the highest for higher education graduates. It should be noted however that unemployment among holders of primary and lower levels of education has been decreasing since the mid-nineties, while that of secondary level holders peaked around 2000 and then began to decline. As for higher education graduates, the unemployment rate has almost doubled since 2000.

The difficulties facing higher education graduates can also be pointed out by the average time it takes to find a job. And this is illustrated indirectly by the figures shown in Table 7 regarding the stock of unemployed graduates.

Several factors may explain the pattern and evolution of unemployment. First is the demographic factor, which in Tunisia has been slowing down at a time of making progress in

increasing access to different levels of education. The interaction between these elements resulted in a continuous modification of the structure of labor supply, particularly in the form of relative increase in the supply of skilled labor and relative decline in the supply of unskilled labor. Indeed the flow of supply of higher education graduates was impressive in light of the rapid increase in enrollment. As reported in Table 13, the last few years saw an average growth rate of higher education graduates at 14 percent. At the same time, the average GDP growth rate was around 4.5 percent. Obviously there is an overall constraint on the employment of higher education graduates.

In addition, the nature and structure of manufacturing industries do not call for highly qualified labor force and skills, even if the situation and features are changing. Another important factor concerns a substantial mismatch between higher education graduates and labor market demand. This fact, observed in a survey on students graduated in 2004 (World Bank and Ministry of Employment, 2008), points out the weak links between firms and universities as well as the rigid educational procedures and mechanisms which prevent higher education institutions from rapidly reacting to industry and business needs, or accurately anticipating the market's need for skills.

Whatever the reason, growing higher education graduate unemployment is clear evidence of resources wastage. Rather than enhancing economic growth and raising the technological level of the economy, feasible measures ought to be taken to reform the organization of universities and strengthen the links with the business world.

In summary, according to the efficiency indicators reviewed here, it can be said that:

- Real efforts have been made to pursue internal allocative efficiency through increasing capital investment, changing the structure of operating expenditure and emphasizing the importance of teaching staff wages, the recruitment of teachers and the improvement of student per teacher ratios. However, a large proportion of faculty members still seem to be lacking appropriate academic skills.
- While rates of return estimated in 2001 were relatively high, the unemployment of higher education graduates has since doubled, reflecting increasing external inefficiency of the higher education sector and a growing mismatch with the labor market.

1.3 Equity of spending

Basically, equity in public spending for goods and services deals with distribution of benefits among groups of potential beneficiaries. These groups can be distinguished according to different parameters. For education spending we can consider the levels of education, the urban-rural divide, gender or income differentials.

In a perfect environment, since access to all levels of education is free of charge in Tunisia (or quasi free), there should be no room for equity concerns since success would only depend on effort and motivation of pupils and students. But reality is far from this ideal situation and differences in family conditions, particularly those concerning education and incomes, substantially affect student results.

1.3.1 Is there a bias against the poor?

Around 2002 the share of public spending on education that was dedicated to higher education in Tunisia was similar to that of OECD countries or for example, Brazil (table 8), and higher than that of lower middle-income countries. This share grew and stabilized at about 27 percent in recent years. Public spending on both higher and pre-university levels increased as a proportion of GDP (table 1). Moreover, because of the advanced demographic

transition—enrollment in primary schools is decreasing while that in university is rapidly increasing—this evolution couldn't be seen as conflicting with equity.[7]

Deepening the analysis needs more data on population distribution by income structure and levels of education, which is now missing. Yet, it is important to note that a number of public policy measures were adopted to address the issue of equity, such as the provision of grants, subsidized accommodations and meals, as well as student loans, on the basis of socio economic status.[8]

With respect to grants, 50 percent of students received such grants twenty years ago. With the rapid growth of student numbers and the scarcity of public resources, this proportion declined despite the fact that the number of grants kept growing. As shown in Table 9, the number of student benefitting from a grant increased from 50,000 in 2000 to 102,000 in 2007, but as the overall enrollment grew rapidly, the proportion of assisted students remained around 30 percent. The public expenditure for that item increased also from 27.5 million dinars to 56 million dinars, but the proportion to the current higher education public expenditure declined from 10.7 to 8.2 percent. The government tried to maintain this support but fiscal constraints limited the effort.

Another mechanism was introduced to the same effect—student loans with an amount equivalent to the grants. In the first period (1986), these loans were financed by the higher education ministry budget.[9] Then (from 1999) the government put the social security agencies in charge of these loans.[10] Table 9 illustrates two trends with respect to student loans. The first is the decline in direct loans from higher education administration (state budget), where the number of concerned students fell from 11,700 in 2000 to 6,000 in 2007, and the amount from 6.5 million dinars to 3.3 million dinars. The second is related to loans offered by social security agencies, which increased rapidly during the first part of the decade and substituted government loans to reach 43,000 student and about 24 million dinars, but since fell to only 27,000 student and 16 million dinars, reflecting the limits of this source of funding.

Public university housing supply increased by 25 percent between 2000 and 2007 but this effort far from matched the accelerating needs. Thus the proportion of beneficiaries fell continuously during this period from 24.7 percent to 16.6 percent.

As we said above, there is lack of data on population distribution by income structure and levels of education. However, some information collected by a survey on university students in 2004 could be useful in giving a view on higher education distribution and in detecting whether a bias against the poor is present.[11] To start with, Table 10 indicates that, the head of the family, educational attainment and average income level are positively correlated. From Table 11, we observe that students from higher income households are over represented comparative to the average population. Thus, despite free access to education, the cultural and economic environment of families affects students' progress and achievements, and students from wealthier households are more likely to benefit from higher education.

---

[7] Actually, as said below, we couldn't certify this due to lack of data on distribution of students among socio-economic groups, but with full access for primary and secondary levels and the large public support for quasi free higher education, some reasonable conclusions regarding equity can be made.

[8] To get a grant, the household gross income should not exceed a ceiling fixed every year by the Ministry, around the minimum wage level.

[9] Financial conditions: interest rate 2.5 percent, repayment during 10 years, after the first job, with two years grace.

[10] Interest rate: 5%, repayment during a period equal to the duration of the studies, with two years grace.

[11] Poor population is of course a relative notion. According to a survey on consumption and budget of households 2005, only 3.8 percent of the population lives with an income under the poverty threshold.

Moreover, Table 11 shows the somehow unfair allocation of public support. Some 8 percent of the students come from the poorest families but receive no support, whereas 3 percent of the students come from families with higher educated heads and benefit from grants or loans. This fact probably results from the procedures of application and the selection process. The problem is that the essential condition to allocate grants is related to income level, and apart from employees (in public or private sectors) income declarations are not always accurate.

Thus, despite free access to higher education and public policy transfers to support the less endowed families, it seems that the low-income population remains disadvantaged in terms of benefiting from this public service.

1.3.2 Is there a gender bias?

Regarding gender equality, during the past 20 years the number of female students enrolled in Tunisian universities has been continuously and rapidly increasing (Table A7, Appendix). In fact, the proportions of male and female students have been reversed. The proportion of female students increased from 37.2 percent in 1987/88 to 59.1 percent in 2007/08. Consequently, as shown in Table 12, the gross enrollment rates for females at the tertiary level passed the male rate in 1999, and has consistently increased since, leading to a gender parity index higher than 1.4 in recent years.

The trend for graduation has followed a similar path, leading to a higher proportion of female university graduates in 2007 (close to 61 percent, as shown in figure 6).

This situation is the result of a differentiated evolution of male and female enrollment in the secondary education cycle. As observed in Table 13, until the end of primary school, the net enrollment rates have almost always been quite similar. From 2000 onwards, female enrollment grew faster during secondary schooling. Actually, young females realize better results and success rates, whereas males show more failure and abandoning. This trend continues until the *Baccalauréat*, leading to a larger number of females in higher education than males.

To sum up, with regard to gender, it is obvious that women have benefited from the expansion of higher education, as female participation depicted by enrollment and graduation has considerably increased over time surpassing that of males.

2. Challenges

Present and future challenges of financing higher education in Tunisia arise from the need to improve access to university, and the quality of outcomes. Adjustments to meet the targets of better efficiency and equity must go hand in hand with efforts to match the increasing demand for higher education. To ensure more funding, various strategies should be investigated, including greater private contribution.

2.1 The demographic challenge

During the last 20 years the total fertility rate has declined consistently from 4.4 in the 1986 to 2.0 births per woman in 2005 and 2006 (figure 7). The natural growth rate of the population declined from 2.7 percent in the early 1980s to 1.3 percent in 2004 and is currently estimated at around 1 percent. In population projections, the medium hypothesis is for the total fertility rate to decline to 1.75 by 2024. This evolution would bring it closer to the average for OECD countries.

Population size and structure are as presented in Appendix Tables A10 and A11 and Figure A1. Young groups corresponding to primary and secondary education will continue to decline before slightly increasing again around 2020. But the 20–24 year group begins

declining from 2009. The peak of students is expected to happen in 2011–2012, and government estimations are about 480,000 students for that period. However other estimates which take into account adjustments for secondary school students, expected graduates for secondary cycle *(Baccalauréat)*, and impacts of reforms to proliferate inside the higher education system, suggest a lower peak, around 450,000 or fewer students. In any case, within three to four years, enrollment in higher education should increase by 100,000 or more, and this represents an urgent and sharp pressure on public finance.

2.2 The quality of higher education

Promoting the quality of higher education is a central objective of government policy. This is intended to be the main instrument to enable students to participate successfully in the knowledge economy, to answer the labor market's increasing demand for highly skilled workers and to enhance opportunities for economic growth.

Several studies evaluated the potential positive correlation between education quality and economic growth, such as Hanushek and Kimko (2000), Barro (2001) and Altinok (2006). These studies observed that quality contribution is higher than that of quantity. But even if education quality attributes are well defined—meaning sufficient and skillful faculty staff, various and adapted teaching equipment and efficient management rules—then measuring education quality is always easy.[12] Beyond the number of graduates, the acquired skills need to be assessed. Implicit assessment is given by external efficiency indicators, but some additional and interesting information can be obtained from the data, such as the number of years to complete the degree or graduate, or scores on international tests, and surveys on achieved educational skills. Along the same lines, international rankings dealing with quality of education and especially higher education may provide useful information on the relative position of different countries. One example of this ranking can be found in the Global Competitiveness Report of the World Economic Forum.[13]

For Tunisia, among the efficiency enhancers, higher education and training—and particularly the quality of math and science education—prove to be a positive factor. In fact, since the late 1990s, policies have been introduced to increase enrollment in the science and technology faculties as well as the establishment of short paths for technicians. Thus the number of students in sciences and technology doubled between 2000 and 2008 and their proportion in the overall enrollment increased from 29 percent to 37 percent, (table 15). As for graduates, their number has more than doubled and their proportion rose from 29 percent to 34 percent in the same period. This progress raises the country above lower middle income countries and closer to the OECD country average. Graduates of short cycles[14] increased from 25 percent to 40 percent of total graduates.

The framework to improve the quality of higher education was set up in 2008 with a new Higher Education Act. The major commitments are:

- The design of a new higher education system based upon the Bachelor-Master-PhD scheme, being consistent with international standards, and generalizing the short cycles' option (except for special studies such as medical and engineering subjects). This

[12] This is stressed, in particular, in World Bank (2008).

[13] "Higher education and training" is 17 percent - weighted pillar of the subindex "Efficiency enhancers"; it is equally composed of: quantity of education (33 percent), quality of education (33 percent) and On-the-job training (33 percent). Quantity of education is calculated from hard data on secondary enrollment, tertiary enrollment, and education expenditure. Quality of education index and the On-the-job training index are composed upon data gathered by The World Economic Forum's Executive Opinion Survey. Quality of education index is grounded on four components: quality of the educational system, quality of math and science education, quality of management schools, Internet access in schools.

[14] These are higher education degrees, 2-3 years after *Baccalauréat*.

structural reform was gradually introduced since 2006–2007, providing an opportunity for revising the higher education curricula to match international norms and become more relevant to labor market needs. An important mechanism decided for this latter goal is the co-construction of applied diplomas (applied bachelor degree and professional master). University and professionals cooperate in the design, implementation, monitoring and evaluation of these studies.

- A greater decentralization towards universities and departments, enhancing responsibilities in financial management, academic actions and quality development by introducing specific programming units. This reform direction towards the "devolution of spending authority", seeking a more efficient use of public resources, is developed within a contracting approach where education and research programs are incorporated in four-year contracts, renewable after external assessment, between the ministry and universities, setting targets to achieve and means to be available, through government funding and own resources.

  To improve academic quality and institutional performance, two new resource transfer mechanisms were established:

  - Block grants directly awarded to universities on a competitive basis, to improve the quality of programs and teaching.
  - Management capacity grants to strengthen institutional management and ability to operate independently.
- The introduction and generalization of higher education organizations' assessment grounded upon clear criteria: internal efficiency, external efficiency, pedagogy innovation and pedagogic skills of teachers, scientific output, relationship and partnership with economic environment as well as foreign universities.

  For this purpose, a National Authority of Assessment, Quality Assurance and Accreditation, was created.

2.3 Private provision of higher education

The involvement of the private sector in higher education (teaching projects and accommodation projects) has been an important component of public policy since the late 1990s. Many incentives were devised for this purpose, among them:

- an allowance for investment, to a maximum of 20 percent of the project cost;
- setting land at the disposal of investors to carry out their projects;
- state funding of national permanent teaching staff salaries for 10 years, with a ceiling of 25 percent;
- state responsibility for the employer contribution to the social security system relative to national permanent teaching staffs salaries, for 10 years; and,
- reductions of taxes on higher education and accommodation firms' profits during the first 10 years.

Partnerships between public and private universities are also encouraged, especially for cooperation for teaching programs and faculty staff exchange. It is clear, however that these measures and incentives have not been able to achieve the targets of ensuring that private enrollment reach 20,000 students in 2006, and then increase further after that. Several reasons have been put forward to explain this failure:

- It seems, first, that a conflict exists between the way the government uses its monitoring and control action, and the need for autonomy and flexibility on the part of the private operators.
- The investment allowances regulation proved to be difficult to implement.

- The objective of stimulating a private and public universities partnership proved to be rather unfeasible, because of the congestion in the public system.
- The weak demand for private higher education suggests a lack of academic credibility, which needs to be built up and guaranteed. In the face of comparatively high prices and relatively poorer quality, rich families would prefer to send their children abroad.

To sum up, the private provision of higher education will remain marginal as long as the public system ensures free access to graduates of secondary school. However, in the public system, private accommodation could be developed to reduce the government's fiscal burden.

3. Future Financing Strategies

In the face of the increasing future demand for higher education, and the need to raise quality at different levels (infrastructure, teaching, working conditions, organization and management, strengthening relations with economic firms and institutions), public financing will face severe pressures. Additional funding sources must be investigated in addition to economies that could be produced by more efficient management mechanisms. In addition, diversification of funding can be achieved essentially through three channels: education cost sharing, partnerships with economic firms and institutions, and private provision.

Government policies as stated in the economic and social development plans are in line with these principles, when they recall the following principles:

- increasing the resources of universities which are composed of tuition fees and revenues from possible contractual activities;
- restructuring public support to students by progressively substituting loans for grants;
- adjusting, when possible, the pricing of public accommodation and catering and,
- developing the private provision of higher education and services (student residents and restaurants).

3.1 Education cost sharing: tuition fees

This issue has been largely discussed and analyzed in the academic literature as well as by international organizations.[15] In the Tunisian case several studies have focused on this topic and formulated recommendations. [16]

If the adjustment of tuition fees is commonly proposed by analysts to shift part of the direct cost of education to students and their families, special attention must be given to ensuring that talented students are not excluded because of lack of resources, and equity in the access to higher education must be promoted. Raising students' contributions should take into account the socio-economic situation of students and their families. The burden of the adjustment should be affordable. The most socio-economically vulnerable students should benefit from sufficient government support.

Various studies and investigations have estimated the possible student contribution at 20-30 percent of the direct cost of education. For Tunisia, one proposition was to establish progressively (during 5 years) tuition fees at 10 percent of this cost. Simulations of the impact of this kind of adjustment, connected to income statistics, asserted an average burden increasing from 0.3 percent to 3 percent of students' budget, during the implementation period. Naturally, the burden is lower for high income students and higher for low income ones. Logically public support beneficiaries should be protected by an equivalent increase in the grant amount.

[15] For examples see the following references: - Woodhall, Maureen, (ed) (2002); OECD (2003); Commission Européenne (2000); Johnstone, D. Bruce with Alka Arora and William Experton, (1998); Sanyal, Bikas C., (1998).

[16] Ministry of Higher Education, Tunisia, Education Sector Strategic Study, 1995.

3.2 Education cost sharing: grants and loans

A cash financial support system mainly consists of the loosening of the liquidity constraint of poor families. It is intended to contribute financing opportunity costs and also direct costs when substantial tuition fees and other university services prices are established. Permitting higher education access to students with proven academic skills but lacking resources, this mechanism improves social efficiency.

The poorest among these students would be afraid of failing to reimburse loans contracted, which is why they should be prioritized for grants. Also, as skills are developed progressively with education, enhancing potential success and professional prospects, loans should be allocated for intermediary and final studies levels.

As seen in section 1.3, in recent years, grants have been provided to around 30 percent of students, and loans to about 13–15 percent, falling to 10 percent in 2007. Future evolution should invert these ratios. The efficient allocation of grants needs a rigorous device to select deserving students, avoiding cheating and preventing free riders, as well as ensuring accordance of academic progress to eligibility criteria. Obviously, this is not the case now, when the basic condition to receive a grant is that parents' income must be lower than the legal wage, about 2500 TND in 2005. During this period, revenues of the poorest households (11 percent) were below this level.[17]

With loans, shifting the trend would require reforming the present mechanism. With the social security agencies suffering tight financial constraints, they would be reluctant to allocate limited resources to finance students. Maintaining a sustainable system requires a specific mechanism, an autonomous fund to finance and manage student loans. Resources of the fund should be collected from the social protection agencies and eventually the state, and later from banks and financial institutions. A crucial mission of the fund is recovery of loans and returning them back into the loan scheme. The establishment and management of the fund could be based on the acquired experience of social security agencies in this field.

3.3 Sharing living costs: accommodation and catering

Public support for student accommodation and food expenditures can also be argued on the grounds of social efficiency and equity. It contributes to the financing of direct education costs, especially for students whose families live far from the university, and to the opportunity cost particularly for the poor, who otherwise could not bear the loss of possible income with continued education. However, public finance constraints call for adjusting these subsidies and raising these services rates.

Currently, subsidized meals provided in university restaurants are very cheap (0,200 TND) and open to all students. This situation leads to some observed waste. Reforming this need to take a two-sided approach: firstly to increase the price of the basic subsidized meal and limit cheating and secondly to diversify food supply at the real cost.

As for tuition fees, simulations of the impact of prices' progressive adjustment asserted a sustainable average burden. The impact burden is lower for high-income and higher for low-income student, thus the latter group should be compensated by an equivalent increase in the grant amount.

3.4 Entrepreneurial activities: partnership university-environment

Creating and developing solid links between universities and the economic environment are commonly acknowledged as crucial for education institutions, firms, administrations and the

[17] Survey on consumption and budget of households, National Statistics Institute, Tunis, 2005.

society in general, especially in the knowledge economy age. Paid services may also be a substantial financing source.

These activities could consist of training and teaching programs, consultancies, research and development contracts and patents operation. Naturally, this orientation should not compromise the basic mission of a university, namely, teaching and scientific research.

The efficient development of entrepreneurial activities needs some specific conditions, mainly the availability of organizational structures operating as interfaces between universities and industries, with different possible frames, having management autonomy, qualified personnel, and appropriate legal and financial procedures. In Tunisia, even if this objective has been regularly proclaimed, few results have been observed. University paying services hardly reached 1.5 percent of public higher education expenditures in 2002. The principal barrier seemed to be the lack of institutional capacity, that is, autonomous skillful structures. The recent reforms presented in section 2.2, particularly the established autonomy of universities and a contracting approach for funding, connected with evaluation and quality monitoring, are likely to push ahead universities' relations with the economic environment.

3.5 Private provision of higher education and university services

As discussed above, the development of private higher education has been quite limited, squeezed by pricing constraints, quasi-free access to public system, and the competition of studying abroad. Nevertheless, there is room for private supply of high quality and differentiated from public outcomes. Two main conditions are required to facilitate this evolution, both for education institutions as well as university services such as private accommodation:

- the availability of flexible and transparent mechanisms of accreditation and monitoring of institutions, in particular assessing quality standards, and
- the adoption of transparent and fast incentive mechanisms. It would be more efficient to shift investment and faculty staff contingent allowances into a subsidy per student. However, this mechanism would be subject to asymmetric information problems and demands of highly qualified administration and auditing.

4. Conclusion

Tunisia has taken important steps along the road of higher education development. Larger amounts of public resources have been allocated to financing education to accommodate the increasing number of students. Efforts have been exerted to keep up investment expenditures and to rationally allocate the current spending. The public support for students through the grants and loans system and other subsidized services is based on social efficiency and the equity of higher education.

However, there remains a wide gap between Tunisian standards and those of the advanced countries. Further progress is needed to enhance education quality, size and composition of faculty members, as well as equipment, technology and management.

This quality challenge and the need to modernize and adapt are harshly reflected in increasing graduate unemployment. The second major challenge for Tunisian higher education is the demographic challenge, represented by the high and increasing rates of enrollment.

In the face of these challenges, public funding indicators seem to have reached their limits. Current institutional reforms may enhance rationality and efficiency in resource allocation and promote cost-effective behaviors. Nonetheless, there is an urgent need for funding source diversification and supplementary contributions from the private sector, in the form of cost sharing mechanisms, partnerships with firms and economic institutions, and private provision of education. Simple and feasible measures and procedures are available to raise students'

contributions, and attract non-governmental revenues by paying services. Even if it seems a difficult political choice, a stronger development of private provision is desirable and possible with appropriate incentives and regulation.

References

Abdessalem, T. 1997. "Biens Publics avec Exclusion: Allocations Efficaces, Production Décentralisée" (Public Goods with Exclusion: Efficient Allocation, Dispersed Generation). *Monographies d'Econométrie*. Paris: CNRS-Editions.

Abdessalem, T., Gurgand, M. and Lévy-Garboua, L. 1998. "Le Financement Public de l'Enseignement Supérieur: les Implications de la Théorie du Capital Humain" (Financing Public Higher Education: Implications of the Theory of Human Capital). In *Mélanges En L'honneur Du Professeur Jean Vincens*. (*Mixtures In Honor of Professor Jean Vincens*) Presses de l'Université des Sciences Sociales de Toulouse.

Altinok, N. 2006. "Capital humain et croissance: l'apport des enquêtes internationales sur les acquis des élèves" (Human Capital and Growth: The Contribution of International Surveys on Student Achievement). *Economie publique*. Institut d'économie publique. IDEP N. 18–19, 2006/1–2.

Barro, R.J. 2001. "Education and Economic Growth". In "*The Contribution of Human and Social Capital to Sustained Economic Growth and Well-Being"*, ed. Helliwell, J.F. Chapter 3, pp. 14 – 41. OECD.

Benos, N. 2007. "Education Policy, Growth and Welfare". Mimeo. Athens: Center of Planning and Economic Research.

Cardack, B.A. 2005. "Education Vouchers, Growth and Income Inequality". *Macroeconomic Dynamics* Vol. 9, pp. 98–121.

Chen, H.J., 2005. "Educational Systems, Growth and Income Distribution: A Quantitative Study". *Journal of Development Economics* Vol. 76, pp. 325–353.

Commission Européenne. 2000. *Vingt années de réformes dans l'enseignement supérieur en Europe: de 1980 à nos jours (Twenty Years of Reform in Higher Education in Europe: 1980 to Today)*. Bruxelles: Eurydice.

Fernandez, R. and Rogerson, R. 1995. "Education Finance Reform and Investment in Human Capital: Lessons from California". *NBER, Working Paper No. 5369*.

Fernandez, R. and Rogerson, R. 1999. "Equity and Resources: An Analysis of Education Finance Systems". *NBER, Working Paper No. 7111.*

Glomm, G. and Ravikumar, B. 1992. "Public versus Private Investment in Human Capital: Endogenous Growth and Income Inequality". *Journal of Political Economy* Vol. 100, pp. 818–834.

Hanushek, E.A. and D.D. Kimko. 2000. "Schooling, Labor-Force Quality, and the Growth of Nations". *American Economic Review.* Vol. 90, N. 5, pp. 1184 –1208.

Johnstone, D. B., with Alka Arora and William Experton. 1998. "The Finance and Management of Higher Education: a Status Report on World Wide Reforms". A Department Working Paper (http://www.fel-web. org /fel/ bolonia/ noabolonia .es/ bancomundial .pdf) . Washington, D.C: The World Bank.

Lucas, R. 1988. “On the Mechanics of Economic Development”. *Journal of Monetary Economics* Vol. 22, pp. 3–42.

Ministry of Higher Education. 2008. *Scientific Research and Technology: Statistics of Higher Education.* Tunisia.

____. 2004. “*Higher Education Financing Studies”*. Tunisia.

____. 1997. and 2004. *Higher Education Financing Studies*. Tunisia.

____. 1995. *Education Sector Strategic Study.* Tunisia.

National Statistics Institute. 2004. “*General Census of Population”*. Tunisia.

____.2004. *Housing and Population-Employment Survey*. Tunisia.

____.2008. *Households Consumption and Budget Survey 2005*. Tunisia.

Organization for Economic Cooperation and Development. 2003. *Education at a Glance: OECD Indicators*. Paris.

Organization for Economic Cooperation and Development. 2007. *Education at a Glance: OECD Indicators*. Paris.

Pritchett, L. 2001. “Where Has All the Education Gone?” *World Bank Economic Review,* Vol. 15, pp. 367 –391.

Psacharopoulos, G. 1994. "Returns to Investment in Education: A Global Update". *World Development* Vol. 22, N. 9, pp. 1325–43.

Psacharopoulos, G. and H.A., Patrinos. 2002. “Returns to Investment in Education: A Further Update”. Policy Research Working Paper 2881. World Bank.

Romer, P.M. 1990. “Endogenous Technological Change”. *The Journal of Political Economy* Vol. 98, N. 5, pp. 71–102

Sanyal, Bikas C. 1998. "*Diversification of Sources and the Role of Privatization in Financing of Higher Education in the Arab States Region*". Paris: International Institute for Education Planning /UNESCO.

UNESCO Institute for Statistics (UIS). 2007. *Comparing Education Statistics across the World: Global Education Digest*. Montreal.

Woodhall, Maureen, (ed.). 2002. "Paying for Learning: The Debate on Student Fees, Grants and Loans in International Perspective". *Special International Issue of the Welsh Journal of Education* Vol. 11, N. 1.

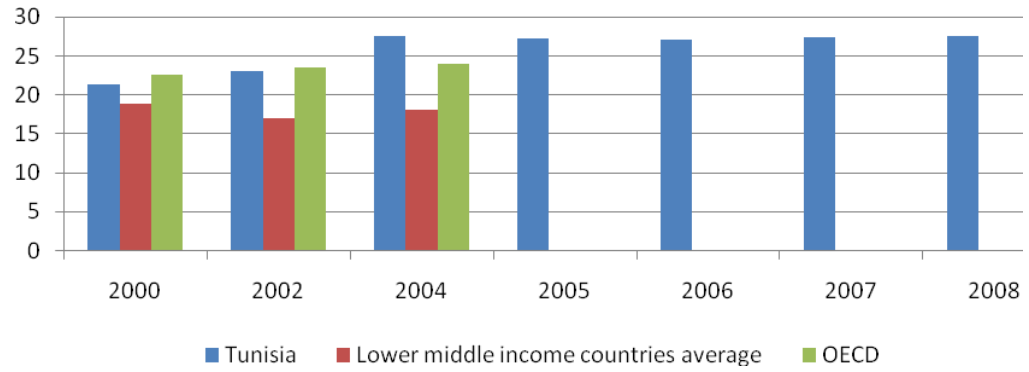
The World Bank. 2008. *The Road not Traveled, Education Reform in the Middle East and North Africa*. Washington, DC.

____. 2007. *Education Statistics Database* (*EdStats) – Global Country Data – Data Query System*.

The World Bank and Ministry of Employment. 2008. “Dynamique de l´Emploi et adéquation de la Formation parmi les Diplômés Universitaires” *(Dynamics of Employment and Training Fitness among University Graduates)*, *Volume 1: Rapport sur l’insertion des diplômés de l’année 2004* (Report on the Integration of Graduates of 2004). Tunisia.

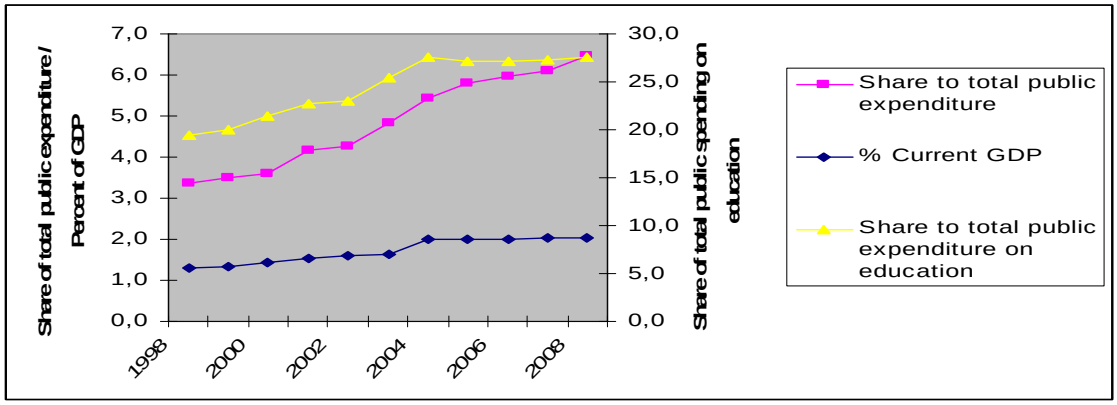
Zhang, J. 1996. “Optimal Public Investment in Education and Endogenous Growth”. *The Scandinavian Journal of Economics* Vol. 98, pp. 387–404.

Figure 1: Share of Public Higher Education Spending to Total Education Spending (percent)



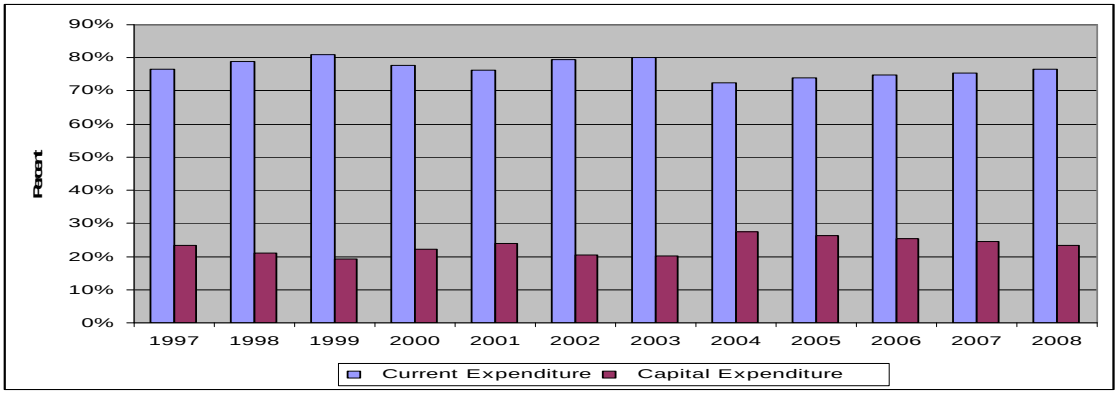
Source: World Bank, Edstats database, OECD Online database and Tunisian Statistics (National Statistics Institute, Ministry of Higher Education, Scientific Research and Technology, Ministry of Development and International Cooperation).

Figure 2: Public Spending on Higher Education in Tunisia (percent)



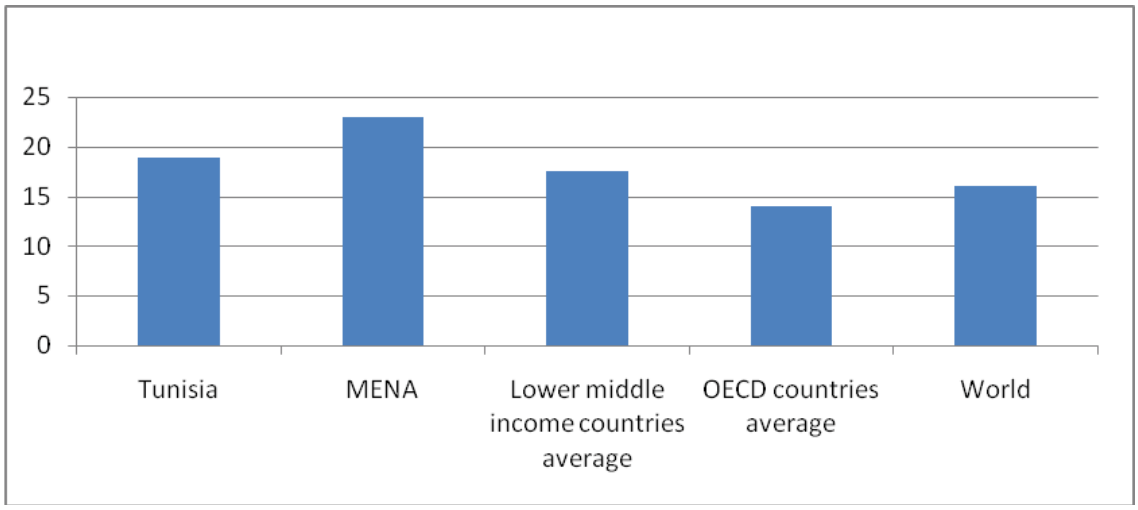
Source: National Statistics Institute, Ministry of Higher Education, Scientific Research and Technology, Ministry of Development and International Cooperation, Tunisia.

Figure 3: Expenditure on Higher Education in Tunisia (percent)



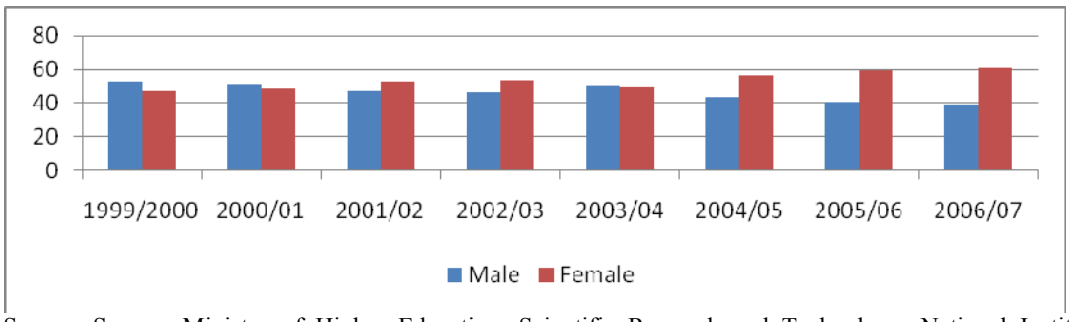
Source: National Statistics Institute, Ministry of Development and International Cooperation, Tunisia.

Figure 4: Students per Teacher ratio in Higher Education, 2005



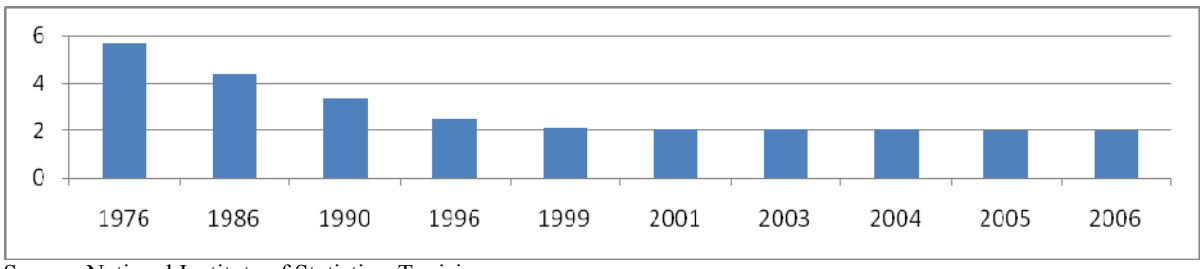
Source: Global Education Digest 2007, Ministry of Higher Education, Scientific Research and Technology, Tunisia

Figure 5: University Graduates by Gender in Tunisia: (percent)



Source: Source: Ministry of Higher Education, Scientific Research and Technology, National Institute of Statistics, Tunisia.

Figure 6: Fertility Rate in Tunisia



Source: National Institute of Statistics, Tunisia.

Table 1: Ratios of Public Higher Education Spending and Total Public Education Spending

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Public Higher Education Spending as % GDP	1,30	1,32	1,43	1,55	1,62	1,64	2,01	2,01	2,01	2,04	2,04
Public Higher Education Spending as % Total Public Expenditures	3,37	3,49	3,59	4,16	4,25	4,84	5,44	5,81	5,97	6,10	6,45
Total Public Spending on Education as % GDP	6,70	6,58	6,67	6,79	7,03	6,45	7,30	7,39	7,43	7,46	7,39
Total Public Spending on Education as % Total Public Expenditures	17,4	17,4	16,8	18,3	18,5	19,1	19,8	21,4	22,0	22,3	23,4

Source: National Statistics Institute, Ministry of Higher Education, Scientific Research and Technology, Ministry of Development and International Cooperation.

Table 2: Share of Private Enrollment in Higher Education, 2004 (percent)

Tunisia	1.1
Lower Middle Income Average	28
MENA Average	26*
OECD Average	25

Note: *World Bank, 2008.
Source: World Bank, Edstats database; Ministry of Higher Education, Scientific Research and Technology.

Table 3: Expenditure per Student in Higher Education in 2005 ($ PPP and Percent)

	US$ PPP	(%) GDP per capita
Tunisia	4,634	55.8
OECD Countries Average*	9,984	36.65
Lower Middle Income Countries Average**	2,712	55.66

Note: * All OECD countries except Canada, Germany, and Luxemburg. ** From 55 lower middle income countries, average is calculated from 20 countries.
Source: Edstats database; World Development Indicators 2007; and Global Education Digest 2007.

Table 4: Private Rates of Return to Education in Tunisia

	1980	2001	
		Male	Female
Primary Incomplete		2.7	3.0
Primary Complete		3.3	2.8
Secondary	13	5.5	5.5
University	27	10.1	10.5

Source: The Road Not Traveled, Education Reform in the Middle East and North Africa, World Bank, 2008.

Table 5: Some Indicators of Annual Wages by Education Level (2008), Tunisia

	TND	Rate
Minimum Wage	2,500	1
Public Administration remunerations		
Secondary ("Baccalauréat")	4,200	1.7
University		
"Baccalauréat" + 2	6,000	2.4
"Baccalauréat" + 4	7,440	3.0
"Baccalauréat" + 5 and above	9,600	3.8

Source: Ministry of Development and International Cooperation, Tunisia.

Table 6: Unemployment Rate by Educational Level in Tunisia (percent)

Educational Level	1994	2000	2001	2002	2003	2004	2005	2006	2007
None	17.6	9.8	10.1	12.8	11.3	12.7	7.8	8	5.9
Primary	18.3	17.3	17.1	16.6	15.8	15.7	15.7	15.2	13.5
Secondary	13,1	18	16.4	15.9	15.3	14.7	14.9	14.3	15.4
Higher	3.8	10.9	10.4	11.6	11.7	10.2	14.8	17.5	19
Overall	15.6	15.7	15.1	15.3	14.5	14.2	14.2	14.3	14.1

Source: National Statistics Institute, General Census of Population and Housing and Population-Employment Surveys.

Table 7: Higher Education Graduates Unemployment Rate by Year of Graduating - 2007 (percent)

≤ 1999	2000	2001	2002	2003	2004	2005	2006	Average
2.9	13.0	19.7	22.5	29.8	37.5	43.7	61.7	19.3

Source: National Statistics Institute, Population-Employment 2007 Survey, October 2008.

Table 8: Expenditure on Tertiary Education as a Share of Public Education Expenditures (percent)

	2000	2002	2004	2006	2008
OECD	23.5	24	22		
Lower Middle Income Countries	18.4	16.6	18		
Tunisia	21.4	23	27,5	27,1	27,6
Morocco	18	16	15		
Brazil	22	24	19		

Source: National Statistics Institute, Ministry of Higher Education, Scientific Research and Technology, Ministry of Development and International Cooperation, Tunisia; World Bank, Edstat database and OECD online database.

Table 9: Grants, Student loans, University Accommodation

	2000	2002	2004	2006	2007
Grants (1000)	50.0	65.7	88.8	88.0	102.0
% Students	27.8	29.1	29.6	26.2	30.0
Grants (millions TND)	27.5	36.1	48.8	48.4	56.0
% Current Higher Education Public Expenditure	10.7	9.6	9.7	7.9	8.2
Student Loans-HE Ministry (1000)	11.7	7.1	5.8	6.0	6.0
Student Loans-HE Ministry (millions TND)	6.5	3.9	3.2	3.3	3.3
Student Loans-Social Security Agencies (1000)	27.9	38.0	43.1	42.4	27
Student Loans-Social Security Agencies (millions TND)	15.3	20.9	23.7	23.3	16
University Accommodation (1000)	44.5	52.9	56		56.3
% Students	24.7	23.4	18.6		16.6

Source: National Statistics Institute, Ministry of Higher Education, Scientific Research and Technology.

Table 10: Students Family Income (As a Proportion of Legal Minimum Wage) and Educational Attainment, 2004

Education Level of Head of Family	None	Primary	Secondary	Higher	Total
Students Condition					
Granted	1.0	1.1	1.1	2.3	1.2
With Loans	0.9	1.6	2.3	2.5	2.1
None	1.1	1.7	2.7	3.2	2.4
All	1.1	1.5	2.4	3.1	2.1

Source: Higher Education Financing Study, Tunisia, Ministry of Higher Education 2004.

Table 11: Public Support to Students and Family Education Attainment (%), 2004

Education Level of Head of Family	None	Primary	Secondary	Higher	Total
All Population	23	37	32	8	100
Students					
All	12	29	39	20	100
Granted	3	10	5	2	19
With Loans	1	2	5	1	9
None	8	18	30	17	73

Source: Higher Education Financing Study, Tunisia, Ministry of Higher Education 2004.

Table 12: Male and Female Tertiary Gross Enrollment Rate and Gender Parity Index in Tunisia*

	1997	1999	2000	2001	2002	2003	2004	2005	2006
Gross Enrollment Rate, Tertiary, Male and Female	15.1	17.0	19.0	21.3	22.8	26.1	28.5	30.1	31.0
Gross Enrollment Rate, Tertiary, Female	14.1	16.8	-	21.1	25.2	29.4	33.0	35.2	36.5
Gross Enrollment Rate, Tertiary, Male	16.0	17.2	-	21.6	20.5	23.0	24.2	25.1	25.8
Gender Parity Index	0.881	0.977		0.977	1.229	1.278	1.364	1.402	1.415

Note:* Data for 1998 is not available.
Source: World Bank, Edstats.

Table 13: Evolution of Male and Female Primary and Secondary Enrollment in Tunisia, (Percent)

	1997-1998			1999-2000			2004-2005		
	M	**F**	**MF**	**M**	**F**	**MF**	**M**	**F**	**MF**
Net Enrollment Rate-6 years	99.0	98.9	98.9	99.0	98.9	99.0	99.0	99.0	99.0
Net Enrollment Rate-6-11 years	97.0	96.4	96.7	97.3	96.9	97.1	96.9	97.0	96.9
Net Enrollment Rate-12-18 years	69.7	67.4	68.6	71.4	71.4	71.4	73.0	78.0	75.4

Source: Ministry of Education and Training,

Table 14: Ranking of Higher Education- Global Competitiveness Report

Country	Efficiency Enhancers	Higher Education and Training	Quality of the Educational System	Quality of Math and Science Education	Quality of Management Schools	Internet Access in Schools
Tunisia	53	27	17	7	17	34
Egypt	88	91	126	128	116	99
Jordan	63	42	27	37	45	51
Morocco	85	90	100	67	63	70
Syria	104	101	91	60	95	123

Source: The Global Competitiveness Report 2008-2009.

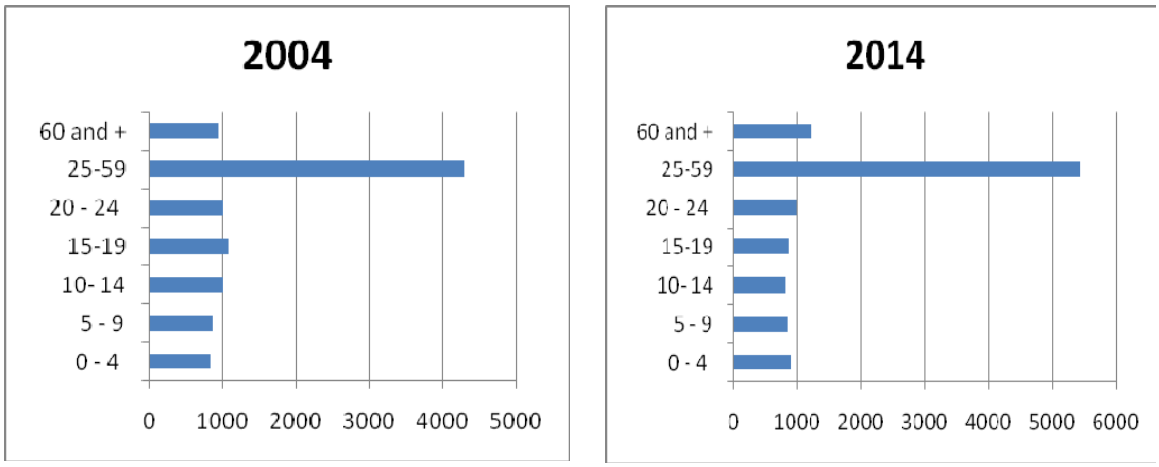
Table 15: Evolution of Enrollment and Graduates by Field of Education

	2000/01	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**	**2006/07**	**2007/08**
Overall Enrollment (thousands)	207	226	272	300	324	336	340	351
Sciences and Engineering	60.2	67.1	81.5	88.6	104	108.2	114.4	130
%	29.1	29.7	30.0	29.5	32.1	32.2	33.6	37.0
	2000/01	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**	**2006/07**	**2007/08**
Total Graduates (thousands)	24.5	28.6	34.2	40.3	49.8	56.6	58.6	63.1
Sciences and Engineering	7.1	7.5	10.9	13.2	17	19.7	20.4	21.6
%	29.0	26.2	31.9	32.8	34.1	34.8	34.8	34.2

Source: Ministry of Higher Education, Scientific Research and Technology.

Appendix

Figure A1: Tunisia Population Projections, by Age Groups



Source: National Statistics Institute, Tunisia.

Table A1: Public Spending on Higher Education - Millions TND

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Nominal	293	325	381	445	486	535	707	757	830	915	990
Real (GDP Price Index)	201	216	246	279	297	317	413	430	454	489	519

Source: National Statistics Institute, Ministry of Higher Education, Scientific Research and Technology, Tunisia.

Table A2: Public Spending on Education

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Public Higher Education Spending as % GDP	1.30	1.32	1.43	1.55	1.62	1.64	2.01	2.01	2.01	2.04	2.04
Public Higher Education Spending as % Total Public Expenditures	3.37	3.49	3.59	4.16	4.25	4.84	5.44	5.81	5.97	6.10	6.45
Total Public Spending on Education as % GDP	6.70	6.58	6.67	6.79	7.03	6.45	7.30	7.39	7.43	7.46	7.39
Total Public Spending on Education as % Total Public Expenditures	17.4	17.4	16.8	18.3	18.5	19.1	19.8	21.4	22.0	22.3	23.4

Source: National Statistics Institute, Ministry of Higher Education, Scientific Research and Technology, Ministry of Development and International Cooperation, Tunisia.

Table A3: Public Spending on Education Levels, (percentage)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Share of public spending on education to total public expenditure	17.4	17.4	16.8	18.3	18.5	19.1	19.8	21.4	22.0	22.3	23.4
Share of public spending on HE to all levels of education	19.4	20.0	21.4	22.8	23.0	25.4	27.5	27.2	27.1	27.4	27.6
Share of public spending on pre-university education to all levels of education	80.6	80.0	78.6	77.2	77.0	74.6	72.5	72.8	72.9	72.6	72.4

Source: National Statistics Institute, Ministry of Higher Education, Scientific Research and Technology, Ministry of Development and International Cooperation, Tunisia.

Table A4: Share of Public Higher Education Spending to Total Education Spending (percent)

	2000	2002	2004	2005	2006	2007	2008
Tunisia	21,4	23,0	27,5	27,2	27,1	27,4	27,6
Lower Middle Income Countries Average	18,8	17	18				
OECD	22,5	23,5	24				

Source: Ministry of Higher Education, Scientific Research and Technology, Tunisia.

Table A5: Structure of Expenditure on Higher Education in Tunisia

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Capital (millions TND)	60	61	83	104	98	105	191	195	207	222	227
Current (millions TND)	233	264	298	341	388	430	516	562	623	693	763
Total (millions TND)	293	325	381	445	486	535	707	757	830	915	990
Capital (%)	21	19	23	24	21	20	27	26	25	25	24
Current (%)	79	81	77	76	79	80	73	74	75	75	76
Total	100	100	100	100	100	100	100	100	100	100	100

Source: Ministry of Higher Education, Scientific Research and Technology, Tunisia.

Table A6: Teaching Staff Evolution

	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	Average increase rate
Professors	681	741	841	855	905	1,012	1,113	1,270	1,338	1,363	1,685	9.5
Assistant- Professors	3,404	3,538	3,872	4,137	4,449	4,597	5,094	5,546	5,997	6,592	7103	7.6
Hospital University Professors	1031	1133	1112	1320	1424	1500	1487	1645	1754	1832	1517	3.9
Others	1,208	1,540	1,864	2,119	2,512	2,844	3,655	4,013	3,890	4,191	4,079	12.9
Contractuals	939	1,309	1,681	1,862	2,650	2,984	3,336	4,197	3,940	4,139	4,224	16.2
Total	7,263	8,261	9,370	10,293	11,940	12,937	14,685	16,671	16,919	18,117	18,608	9.9
Professors	9.4	9.0	9.0	8.3	7.6	7.8	7.6	7.6	7.9	7.5	9.1	
Assistant Professors	46.9	42.8	41.3	40.2	37.3	35.5	34.7	33.3	35.4	36.4	38.2	
Hospital University Professors	14.2	13.7	11.9	12.8	11.9	11.6	10.1	9.9	10.4	10.1	8.2	
Others	16.6	18.6	19.9	20.6	21.0	22.0	24.9	24.1	23.0	23.1	21.9	
Contractuals	12.9	15.8	17.9	18.1	22.2	23.1	22.7	25.2	23.3	22.8	22.7	
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

Source: Ministry of Higher Education, Scientific Research and Technology, Tunisia.

Table A7: University Students by Gender

	1987/88	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
1000										
Male	16.3	89.4	99.7	104.3	117.8	126.9	133.3	134.7	133.6	137.1
Female	27.5	90.7	107.7	121.8	144.7	164.9	178.3	187.1	192.6	198.5
Total	43.8	180.1	207.4	226.1	262.5	291.8	311.6	321.8	326.2	335.6
%										
Male	37.2	49.6	48.1	46.1	44.9	43.5	42.8	41.9	41.0	40.9
Female	62.8	50.4	51.9	53.9	55.1	56.5	57.2	58.1	59.0	59.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Ministry of Higher Education, Scientific Research and Technology, Tunisia.

Table A8: University Graduates by Gender

	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
1000								
Male	11,3	12,6	13,4	15,9	20,4	21,6	23,2	22,9
Female	10,1	12,0	15,1	18,3	19,9	28,2	33,4	35,7
Total	21,4	24,5	28,6	34,2	40,3	49,8	56,6	58,6
%								
Male	52,8	51,2	47,1	46,6	50,5	43,3	41,0	39,1
Female	47,2	48,8	52,9	53,4	49,5	56,7	59,0	60,9
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: Ministry of Higher Education, Scientific Research and Technology, Tunisia.

Table A9: Public Higher Education Students per Teacher Ratio Evolution

	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Overall Enrollment (1000)	180	207	226	272	300	324	336	340	351
Teachers	9370	10293	11412	12937	14,700	16,671	16,919	18,117	18,608
Students per Teacher Ratio	19.2	20.1	19.8	21.0	20.4	19.4	19.9	18.8	18.9

Source: Ministry of Higher Education, Scientific Research and Technology, Tunisia.

Table A10: Population Projections, by Age Groups, (thousands)

Age	2004	2009	2014	2019	2024	2029	2034
0 - 4	814	847	883	881	821	747	714
5 - 9	854	805	839	881	881	822	752
9 - 14	993	847	806	847	881	884	815
15-19	1063	994	850	800	833	884	879
20 - 24	1003	1056	982	835	797	834	879
25-59	4271	4884	5452	5845	6013	6076	6180
60 and +	934	1025	1214	1508	1835	2204	2523
Total	9932	10458	11026	11598	12063	12450	12742

Source: National Institute of Statistics, Tunisia.

Table A11: Population Projections, by Age Groups, (%)

Age	2004	2009	2014	2019	2024	2029	2034
0 - 4	8.2	8.1	8.0	7.6	6.8	6.0	5.6
5 - 9	8.6	7.7	7.6	7.6	7.3	6.6	5.9
9 - 14	10.0	8.1	7.3	7.3	7.3	7.1	6.4
15-19	10.7	9.5	7.7	6.9	6.9	7.1	6.9
20 - 24	10.1	10.1	8.9	7.2	6.6	6.7	6.9
25-59	43.0	46.7	49.4	50.4	49.8	48.8	48.5
60 and +	9.4	9.8	11.0	13.0	15.2	17.7	19.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: National Statistics Institute, Tunisia.