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Education Expenditure and Outcome in Senegal

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Education Expenditure and Outcome in Senegal

Aloysius Ajab AMIN and Tharcisse Ntilivamunda¹

Abstract

Senegal guarantees equal access to primary education for all children. The importance of education and resource mobilisation into the educational sector has been said to be critical in achieving the MDG of education for all by 2015. Is public expenditure on education effective, does it work? If yes, more resources should be allocated to education; and what are the factors affecting the impact of public educational expenditure? Thus, the study examines the relationship between educational expenditure and the outcome, and ascertains what factors affect the outcome, with the outcome being the primary school gross enrolment. The study shows that the adult literacy rate, per capita GDP, the growth rate of GDP, education expenditure as a ratio of GDP, and Educational expenditure as a ratio of total public budget all tend to have a positive impact on the gross enrolment rate, while an increase in unit cost per pupil tends to reduce primary school the enrolment. The Senegalese government spent 3.2 per cent of its GDP on education in 1970 and in 2007 the country spent 3.3 per cent. The highest percentage was in 1978 (4.8 %) and 1993 (4.7%). This level of spending is just the same as in other countries as they tend to spend around 3 to 4 percentage of their respective GDP on education. Total public expenditure as a proportion of total government expenditure shows what portion of the total public expenditure the government spends on education. In 1970 the Senegalese government spent 20.8% and in 2007 it spent 34.3% of its total budget on education, it has increased to 40 %. These figures are the highest compared to other countries in the region. While increase in more resources is necessary, there is greater need for redeployment and more effective with efficient use of the existing resources.

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1. Introduction and background

Senegal has about 12.4 million inhabitants of whom 42 percent live in urban areas and the population growth rate is 2.6 percent. The Gross Domestic Product (GDP) is produced by four main sectors of the economy as follows: - agriculture (19.8%); industry (23.5%); manufacturing (16.5%), and services (56.8 %), with respectively 1.9 %, 4.0%, 2.2%, and 5.4 % growth rates as estimated by World Bank (2008). The Statistics department of Senegal has also put the GDP to be 5407.7 billion francs CFA in 2007. The average annual growth of the economy is estimated at about 4 percent with a GDP per capita of US\$900 (2006 estimate) and inflation rate of about 2.2 percent.

French is the official language, which is also the main language of instruction in schools. In principle and by constitutional provision, Senegal guarantees equal access to education for all children, particularly primary education. Also, constitutionally, education is compulsory and free up to the age of 16. However, in practice, due to limited state resources the law is not fully enforced. The importance of education for all and resources allocated to the education sector have been well highlighted in the 2000 Dakar World Education Forum and the National documents especially PRSP, PDEF (Programme de Développement de l'éducation et de la formation), the regions and local development plans. The resource mobilisation into the educational sector has been said to be critical in achieving the MDG of education for all by 2015.

In 1990 at the World Education for All Conference in Jomtien, Thailand, the World leaders focus on education for all with ambitious and wide-reaching goals by 2015. The Dakar Forum in 2000 reaffirmed the goals set by 2015 of education for all (EFA), stressing on direct approach to address the real problems and deficits as noted in attaining the goals of EFA. While the 164 countries in the 2000 Dakar meeting stated the great progress has been made, they strongly urged for increased resources in order to achieve the goals of education for all by 2015. There is presumption that bigger educational expenditures and increased levels of inputs into the educational sector necessarily results to "better educational outcomes." Many take the public expenditure as the key policy instrument for attaining educational outcomes. At the primary level in the supply of schooling, the public expenditure far exceeds that of non-governmental provision including private expenditures (Brossard and Foko,2007; Krueger, 2003; Saavedra, 2002).

1.1 Senegalese education system and administration

The education sector is administered by relevant ministerial departments in partnership with local communes. Currently, three ministries have been created for the management of the sector. They are (i) the Ministry of Pre-school, Elementary, middle and Secondary Education, (ii) Ministry of High Education, Universities and Universities Centres and (iii) the Ministry of Technical Education and vocational training.

Besides the formal education, the non-formal education is composed of a vast literacy programme which has been important in Senegal. It includes a programme for children between 9 and 14 years old and a functional literacy programme for those aged between 15 and 55 years. Several partners are involved in carrying out this type of education; they include NGOs, development institutions and other organizations. Other new programmes are at experimental level including **Basic Community schools** for children between 9 and 14 years old, who have not been to school or who have dropped out of school at early stage. They are provided with basic practical and pre-professional education in national languages and French for four (4) years.

The formal Senegalese education system has four levels depending on the age of the pupil or student: i) Basic education; ii) Multi-purpose middle-level education; iii) The secondary, technical and vocational education; iv) Higher education (Senegal 2008).

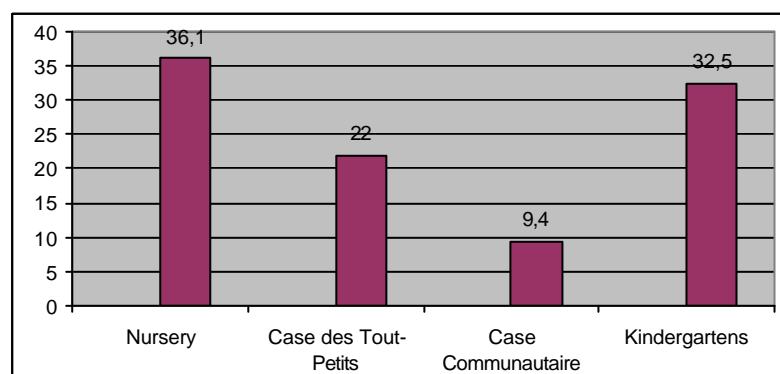
A) The basic education

The basic cycle is sub-divided into a pre-school education system and primary education. At the end of this level, the pupil is adequately equipped with the basic elements for his subsequent adaptation to the next educational level.

Pre-school education

Pre-school education is opened to young children (between 18 months and 6 years). It includes (i) nursery schools and (ii) day-care centers or kindergartens. They are well established in urban areas partly because of high population density. While another programme on group of children – {(the "Case des Tout-Petits", between 0 and 6 years) and the ("Case Communautaire", between 3 to 5 years)} has been established in the rural areas. The distribution of pre-school education in percentage can be seen in the histogram 1.

Histogram 2: Distribution of Pre-school nationally in 2008 in percentages (%).



Source: PDEF (2008)

Primary education

Primary education (our main focus in this study) is open to children at the age of 7 to 12 years old group and geared towards:

- sharpening the mind of the children through some activities likely to foster the emergence and development of their intellectual potentialities of observation, experimentation, analysis and potentialities
- entrenching the children in national culture and values;
- guiding the children in the mastery of the basic elements of logical and mathematics, thinking, and the mastery of the instruments of expression and communication to enhance manual work and introduce the children to the elementary techniques involved in production activities;
- seeing to the artistic, cultural, physical and sporting interests and activities of the children for the full self-realization or fulfilment of their personality ;
- to contribute, together with the family in particular, to securing the social, moral and civic education of the children.

B) Multi-purpose middle-level education:

This education level is intended for the 13-16 years age group. According to PDEF (2008), the target population has an average annual growth rate of 2.1% for the period 1999 - 2007. The percentage of girls in the school age population decreased from 50.7% in 1999 to 49.4% in 2007. The regional distribution indicates that Dakar has the highest potential demand with 17.4% followed by the regions of Thies, Kaolack and Diourbel with 12.9%, 11.5% and 10.6% respectively. Percentages of other regions are less than 10%.

C) The Secondary , technical or vocational education

The secondary and vocational education comprises a general secondary education and a vocational training. At the end of the secondary and vocational level, the students choose to either pursue a professional activity or higher education. The general or technical secondary education, equips the students with the knowledge and aptitudes required for gaining access to the different niches or branches of higher education, while enriching and deepening the training previously acquired.

The education level is a multi-purpose education system with students ending up with a final examination for the certificate called: “Brevet de Fin d’Etudes Moyennes” (BEFM) which is the Middle School Leaving Certificate. The level is open to the 17-19 years age group. Between 1999 and 2007 the average annual growth rate is 2.3%. The population distribution of this group remains the same on regional level. Dakar has the highest

percentage followed by the regions of Thiès, Kaolack and Diourbel with 20.80%, 12.9%, 10.6% and 10.4% respectively (PDEF, 2008).

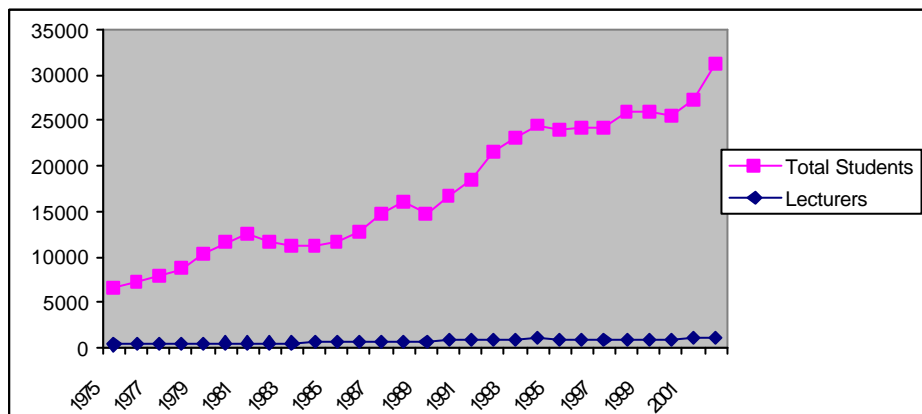
The vocational training offered in the middle-level vocational schools or in learning, prepares the students for entry into active life by getting them acquainted with the theoretical and practical knowledge, aptitudes and skills required for the mastery and exercise of a given trade. The forms, contents and objectives of vocational training vary according to requirements peculiar to the specific trades, and the structures in which they are offered depending on national needs and resources.

D) Higher education

The main objective of the higher education is to train development officials in order to enable them play a significant role in the creation of knowledge, thinking and promotion of development.

There are two main public universities: (i) the Cheikh anta Diop University of Dakar (UCAD) and (ii) the Gaston-Berger University (UGB) of Saint Louis. Due to rapid increase in total number of students in the two universities, the universities face some challenges in the smooth implementation of the curricula. The graph 1 shows the trend of total number of students and lecturers in the two universities from 1975 to 2002. Recently the three additional regional universities have been created.

Graph 1: Trend of students and lecturers in the two public classic universities of Senegal.



Source: (i) Statistics office of the UCAD Rectorate, (ii) UGB Dakar Office and (iii) estimations by the authors

2- Justification of the study

The relation between investment expenditure in the education sector and economic growth has been shown to be highly positive. Studies (Easterly and Rebelo, 1993; Dabla-Noris and Matovu, 2002; Todd and Wolpin, 2003) have shown education as a key factor for growth and poverty reduction. Bose et al. (2003) examining this relationship, conclude that investment in education is highly significant with a large magnitude – an

increase of government investment in education relative to GDP results to an increase of real GDP per capita of 1.5 percentage points. Roberts (2003) has strongly argued that education is crucially important in improving the personal lot of individual, achieving income growth and poverty reduction. Much progress has been made towards universal primary education (UPE), with increasing raising rates of enrolment in primary education. The question is: is public expenditure on education effective, does it work? If yes, more resources should be allocated to education; and if not what are the factors adversely affecting the impact of public educational expenditure? It is, therefore, important to examine the relationship between education expenditures and outcomes to see what could be done to improve the educational outcomes with a given education expenditure.

2.1 Objective of the study

African countries have made significant advances in making education more accessible at the primary, secondary and tertiary educational levels with some countries more than others making significant improvements in education expenditure and outcomes. But the relation between resources and education outcomes is not yet clear. The relation seems to be very weak in some countries and do not exist in some, while strong in some countries, (Anyanwu and Erhijakpor, 2007). The relationship between expenditure and outcome is tenuous partly because there is no clear definition of outcome and even expenditure on education. While lessons can be drawn from countries that have achieved UPE at least quantitatively, it is important to examine countries that have not achieved UPE but are making great efforts to achieving that goal. More specifically, focusing on primary education, the study examines the impact of education expenditures on the educational outcomes. Thus, the objective of the study is to examine the relationship between educational expenditure and the outcomes; and to ascertain what factors affect the outcomes in primary education.

Millennium Development Goals (MDG)

In this study, the outcome is on the widely known, rigorously studied and carefully monitored Millennium Development Goals with Goal Two being our focus. With the focus on the outcome as specified by the Target Three, that by 2015 Universal Primary Education (UPE) should be achieved – children everywhere, both boys and girls should complete a ‘full course of primary schooling’. This educational goal poses a tremendous challenge as it is about all children everywhere, and in Senegal it relates to all Senegalese children in everywhere in the country. For lack of a better variable or measurement we concentrate on the primary school enrolment rate and related variables such as completion rate, repetition rate and dropout rate as the educational outcomes, despite the limitation of enrolment rate as a measurement of outcome.

3. Demand and supply

There are many factors affecting schooling. The supply side is related to infrastructure including school buildings and classrooms, school equipment and pedagogic materials, personnel and teachers, conducive school environment, etc. While demand factors include household characteristics, the level of income of the population and demographic characteristics with the level of infrastructure development of the country in general, etc. The main demand-side factors for the households sending their children to school include private cost to households, parental perceptions of the benefits to themselves and their children, and household income. Both on the supply and demand sides, much resource are required in creating and building the educational system and facilities such that the right educational outcomes could be achieved.

3.1. Source of Education Financing

The State usually acquires education finances from many sources with the main sources of education finances being (Saavedra, 2002): - i) public source of finance; ii) private sources of finance and iii) international sources of finance. i) In most African countries the bulk of education finances about 80 percent come from the government or public sector. These finances include direct public spending on education, subsidies to households like scholarships and living expenses. While the privates finances may cover about 20 per cent of the total national education expenditures. These include educational expenses from households, local communities, the private sector and civil society bodies. In most cases the household pays the bulk of the private financing by incurring direct and indirect costs. The household may incur direct costs such as tuition fees, uniforms, teaching materials and transportation. The indirect costs could be in the form of opportunity cost of having the children in school rather than working and earning some income for the family. For very low income families, the foregone income is highly substantial. The international sources of finances may include loans and grants from bilateral, multilateral identities- governments and organizations.

4. Education Expenditure

Total public expenditure on education as a share of GDP reflects the portion of national resources devoted by a country annually to education. But this ratio does not give the actual picture of the total expenditure on education. This is partly because private expenditure is also important. The Senegalese government spent 3.2 per cent of its GDP on education in 1970 and in 2007 the country spent 3.3 per cent. The highest percentage was in 1978 (4.8 %) and 1993 (4.7%). This level of spending is just the same as in other countries as they tend to spend around 3 to 4 percentage of their respective GDP on education (Saavedra, 2002; Roberts 2003; Annexes,4,5,7 and 8).

Total public expenditure as a proportion of total government expenditure shows what portion of the total public expenditure the government spends on education. This measure of government's effort is usually seen as a very large share of the public budget. And if the government devotes a large share of its budget to education it may find it difficult to increase spending on education, but other ways may be found to making the spending more effective. In 1970 the Senegalese government spent 20.8% and in 2007 it spent 34.3% of its total budget on education. These figures are the highest compared to other countries in the region (Roberts, 2003; World Bank, 2008; Annexes 4 and 5).

Senegal's main State Universities are Cheikh Anta Diop University (UCAD) and Gaston Berger University. University level instruction is mainly in French. Public higher education in Senegal benefits from a subsidy system, which until recently provided for 96 percent of the institutions' budgets. For example, in 1997, the budget allocated to education and training was estimated at more than 93.3 billion francs with a significant share allocated to higher education (Ndiaye, 2003; Graph 2 and Graph 3).

The implementation of the Structural Adjustment Programmes (SAP) in the 1980s and 1990s did not seem to seriously result in a reduction of government budget devoted to health and education sectors. However, Diagne and Daffe, (2001) have noted the general reduction might have resulted to:

- Closure of more than three hundred classes in rural areas due to lack of teachers.
- Stagnation of school enrolment in the primary school
- Introduction of doubled-shift and multigrade classes to cope with the increase of the school-going population.
- An increase rate of drop-out particularly in the end of cycle class – the last year (CM2).

In such circumstances, it was very difficult for teachers to cover the programme, so the education quality became a problem. During the 1990s, there was a significant improvement in terms of share of Education Expenditures on Total Government Budget. In fact, the ratio increased from 30.9 % in 2000 to 40.3 in 2007, %. Some sources show 34.3 % (table A1). This shows the importance the government gives to the sector in the development process of Senegal. These figures are more than UNESCO recommended minimum share of government budget devoted to Education of 20 %. Compared to GDP,

the ratio also improved. It rose from 3% in 2000 to 3.3% in 2007. On the average, education spending is about 3.6 percent of GDP. Table A1 shows the trend of Education expenditure compared to GDP and to Government Budget from 1970 to 2007.

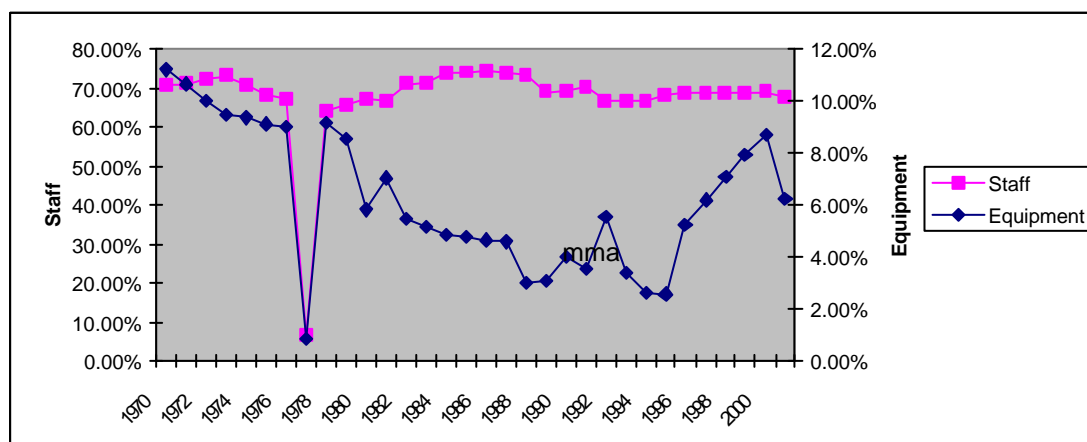
Disaggregate education Expenditures

The recurrent budget of the Ministry of Education of Senegal can be disaggregated into four main components: (i) staff pay package which mainly includes salaries, allowances and other staff benefits (ii) materials, (iii) Maintenance and (iv) Transfers. As in many African economies, the Staff salaries and benefits take an important share of the budget. In fact, an average of 69% of the recurrent budget is devoted to staff budget while only 8% of the budget is devoted to school materials for the period 1970 to 2008 (Graph 2 and Graph 3). Teachers' salaries are usually the largest component of public current expenditure on education. Teachers are also critical inputs in service delivery in the education system, so the way teachers are deployed in the system is very important in obtaining the best outcomes (Ogawa, 2004).

Graph 2 indicates the decrease of the budget amount on materials during the period due to Structural Adjustment Programmes (SAPs) particularly during the period 1980 - 1984. This, among others, led to (i) closure of many classes particularly in rural areas, (ii) involvement of parents in the building of classes between 1980 and 1987 years in rural areas, some of the schools lacked teachers. A positive trend of the material budget was observed after 1995 because of educational reform which was taken in the early 1990s by all education stakeholders after the World Education for All meeting held in Jomtien (Thailand). The capital budget on education had an upward trend for the period 1970 to 2006.

During the 2000s, Education expenditure as a ratio of the total capital budget was clearly improved. From 6% in 2000, the ratio attained 8,2% in 2007 (Cisse, 2005 and PDEF, 2008).

Graph 2: Trend of the Staff and the material budgets on the period 1970 to 2000

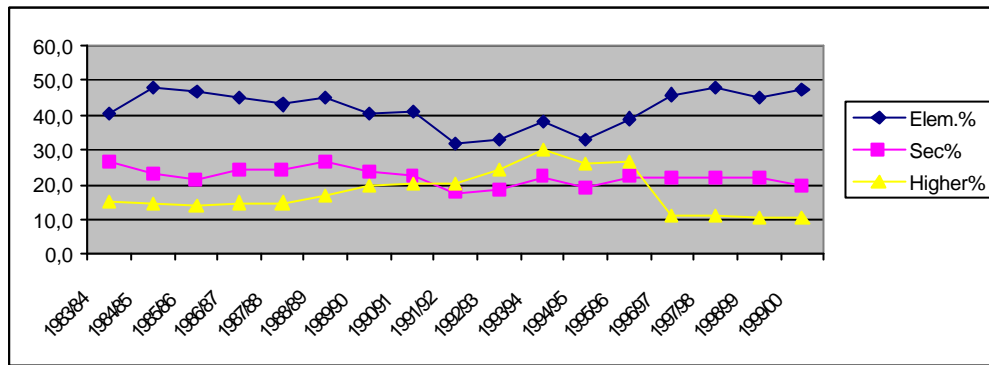


Sources: Cisse (2005) and PDEF (2008)

Recurrent budget by education level Primary, Secondary and Higher schools.

The trend of various budget devoted to primary, secondary and higher education shows the same constraints linked to various adjustment policies implemented by Senegal during the 1980s. The share for the primary school including the pre-school declined from 1984/89 to 1995/96. The same can be said to the share relating to the secondary education which includes technical, vocational and middle-secondary education. The items started to increase in 1995/96 particularly for the share of primary education. The higher education share almost remained the same with a slight improvement from 1987/88 to 1993/94 before decreasing (See Graph 3)

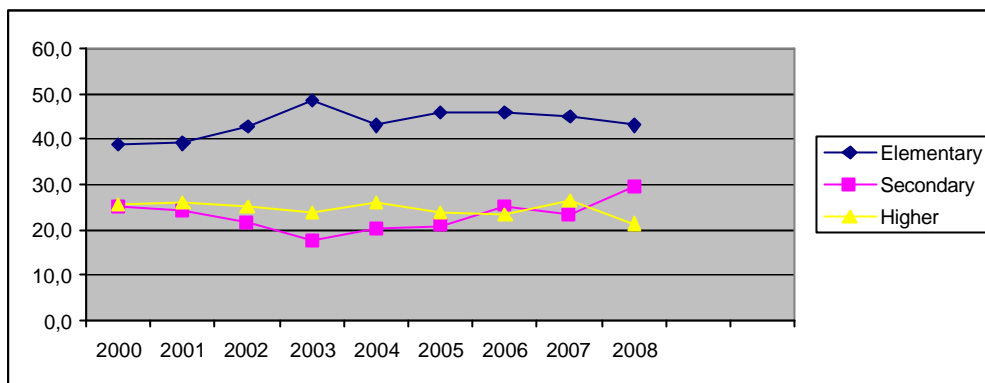
Graph 3: Distribution of the recurrent budget per levels sector from 1983/84 to 1990/2000



Sources: with data from Cisse (2005) and World bank (2008)

During the 2000s, Senegalese authorities stress on the balance of the budget allocation within the three levels. As shown by Graph 4, more efforts seemed to be put on the primary and the secondary school levels, with the higher education level remaining stable. The new education strategy falls in the line with the Education for All (EFA) goal. The EFA strategy aims at providing free and compulsory primary education for all by 2015 in addition to the increase of adult literacy by 50%; this is also by increasing, the budget allocation to the primary education including preschool for all children.

Graph 4: Distribution of the recurrent budget education level from 2000 -2008



Source: Data from PDEF (2008), World Bank (2008)

Resource distribution System

Understanding how public resources are distributed is important in understanding how the public funds are spent in the education sector. On paper the Ministry of Economy and Finance distribute all resources to the other ministries with clearly marked budget heads and subheads, indicating where the funds should go. The salary component is distributed directly to the banking system by a central public agency. It was not possible to go into details on this.

5. Enrolment, completion, repetition and dropout rates in the education sector.

Gross Enrolment rates.

Available statistics suggest that in year 2002, the gross primary enrolment was 80 percent. However, it should be observed that the gross and net enrolment rates are based on the number of students formally registered in primary school; hence, they do not necessarily reflect actual school attendance. In 1997, only 71 percent of primary school-age children and 16 percent of secondary school-age children were actually attending school. In year 2000 it is estimated that 41.2 percent of children ages 5 to 14 years were attending school and it is also estimated that as at 2001, 80 percent of children who started primary school were likely to reach grade 5. The government, through the Ministry of Labour has consistently indicated that the public school system is unable to cope with the number of children that are expected or must enrol each year. Hence, the use of informal means to educate children has also increased. It is estimated that about 100,000 children apprenticed in Dakar at any given period (Diagne and Daffe, 2001; Haughton et al., 2005). Annex 8 shows the Gross enrolment rates for the primary education level. In general, available statistics indicate that average year of schooling of adults is about 2.6 while duration of primary and secondary years is 6.

Enrolment rates in the three education levels.

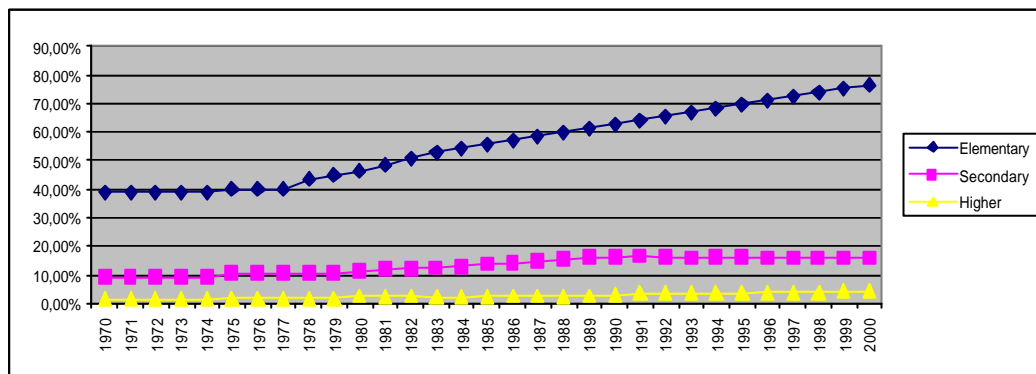
The enrolment in primary school depends mainly on the school-going age population. In Senegal, this school-going age population is represented by children aged from 7 to 12 years as stated in the Senegalese ten-year programme on education and training (PDEF).

The third census conducted in 2002 in Senegal indicates that the population of the 7-12 years age group increased from 1999 to 2007 at 1.8% annually. The age group is composed of a majority of boys that represented 50.4 in 1999 and 51 % in 2007.

Based on data collected in the Senegalese Ministry of education, the average of the Gross Enrolment Rate (GER) in the primary school was 55.30% for the period 1970-2000. Annex 7 shows the trend of the enrolment rate for the period 1970-2007; it is observed that the rate increased through the period. The period of SAP in Senegal also witnessed an increased school demand fuelled by the high demographic pressure of school-going age children. The education authorities adopted different strategies including double-shifts which were more prominent in the more populated areas such as Dakar, Thies and Zinguichor and multigrades classes than in the less populated regions such as Kaolack and Diourbel. Where, in the rural areas the distances to school are long making it also difficult to practice that system as stated in PDEF.

In the secondary and higher education levels, the enrolment rates averages for the periods were 13.26% and 2.65 % respectively. If it is assumed that from the first in-take first year of primary school, the pupils can go through the whole education system, a high drop out rate from the system could be inferred particularly for the higher education as a sharp increase in enrolment is observed in the primary education but the other two levels tend to have very slight increase (Graph 5).

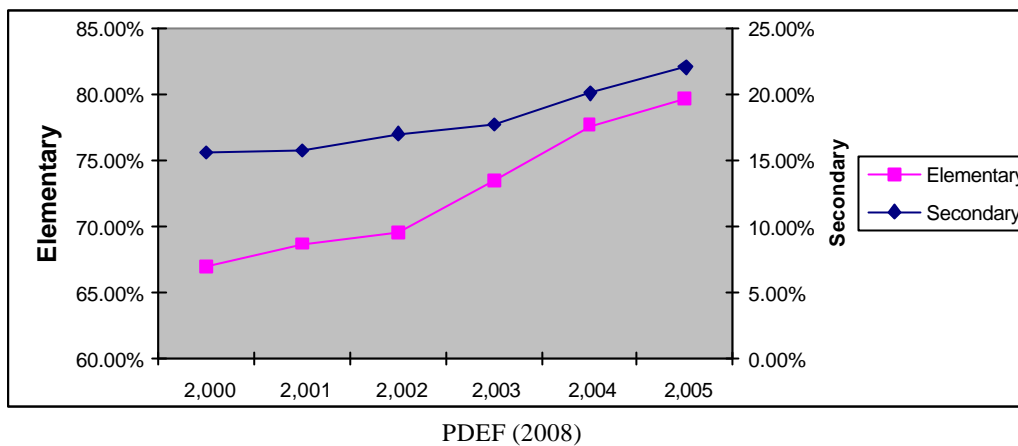
Graph 5: Trend of the Enrolment rates in the three levels from 1970 to 2000



Sources: with data from Cisse (2005), PDEF (2008)

Graph 6 shows that in the 2000s, the enrolment rates in the primary and secondary education increased sharply. Indeed, the average enrolment rates became 72, 68% (primary school) and 18.06 % (secondary school) for the period from 2000 to 2005. On higher education, the average enrolment rate from 2003 to 2005 is 4.5%.

Graph 6: Trend of the Enrolment rates in the primary and secondary levels in the 2000s.



The enrolment rate in the primary school increased in the 2000s with an average of 73% of the total school-going age population. This coincided with the first phase (2000-2004) of the ten-year programme on education and training (PDEF) in which a new education policy of "Education for All" by 2015 was being emphasized. This resulted to an increase in the percent of girls in school. Female enrolment share in primary school is about 46.5 percent while it is about 39.6 percent in secondary schools. It is estimated that about 70 percent of the primary school girls are in school. In General the tertiary enrolment is put at about 3.7 percent.

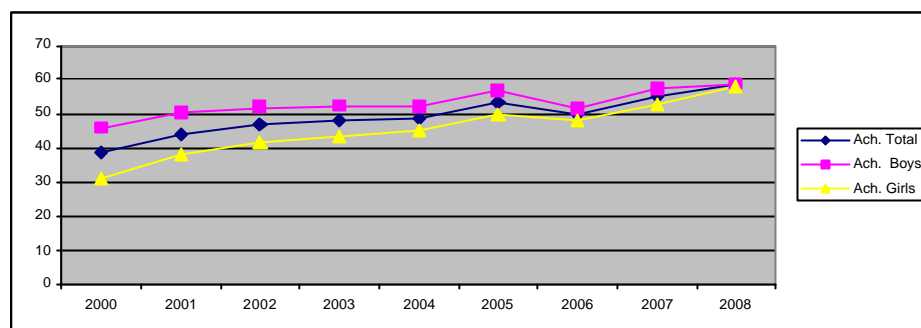
In 1970 the enrolments rates were 38.8% (primary education), 9.3 % (secondary education) and 1.4 % (higher education). In 2007 these rates increased to 86.5%, 16.3 % and 4.7 % respectively. This poses a great challenge to the authorities in trying to narrow the gaps between the different levels.

Achievement and Completion in the primary education.

Primary school completion rate (PCR) can be taken as a measure of progress towards achieving the MDG target. The World Bank estimates it as "ratio of number of children completing the final year primary education cycle to the size of the final year primary age cohort". Senegal is committed to attaining the "universal primary education" (UPE) by 2015. The goal is also to get 85% of 12-aged children in the sixth year or last year of primary school called CM2 by the 2010. We use two ratios: (i) the achievement rate and (ii) the completion rate based on the first School certificate results.

The achievement rate (AR) in the primary school cycle is calculated as a ratio of the total number of those newly registered in the CM2 to the 12-aged population; or those pupils promoted from CM1 to CM2. Note that this does not include the repeaters in CM2. From 2000 to 2008, the AR increased from 38.6% in 2000 to 58.4 % in 2008. But it fell 2006 to 49.7% and then rose to 58.4% in 2008. The decline in 2006 is greater for girls than for boys (table 1). To attain the target of 85% more effort is needed. This is partly because of the very low registration rate of girls especially in the first year of the primary school (CI) and through the other school years.

Graph 7: Primary school achievement rate in the 2000s



Source: PDEF (2008)

Considering the UPE objective to get about 85% of 12-aged children to attain the CM2 school year, it can be noted that the total achievement rate of 58.4 % in 2008 is still far from the target.

Primary school completion rate (PCR)

The first school certificate -Certificat de fin d'étude élémentaire (CFEE)- results are also an indicator of completion of the primary level of education. The certificate is awarded to pupils in CM2 who successfully pass the final year examination in the primary education cycle; and they all have the opportunity of entering into the first school year of the middle cycle or secondary education cycle. From 2000 to 2008, the completion rate improved from 46.8% to 70.7% in 2000 and 2008 respectively (table 2). The completion rate for girls tends to be less than that of boys.

Table 1: Achievement and repetition rates 2000-2008

Years	Achievement rates (Primary school)			Repetition rates (Primary school)		
	Total	Male	Female	Total	Male	Female
2000	38.6	45.8	31.2	13,6	13,7	13,5
2001	44.1	50.1	37.9	13,9	14,1	13,7
2002	46.8	51.8	41.7	13,7	13,7	13,6
2003	48.0	52.3	43.5	13,8	13,9	13,7
2004	48.8	52.2	45.3	12,9	13,1	12,8
2005	53.4	56.9	49.8	11,9	11,9	11,8
2006	49.7	51.3	48.1	10,6	10,8	10,5
2007	55.1	57.3	52.9	10,5	10,7	10,4
2008	58.4	58.8	58.0	10,5	10,7	10,4

Sources: Achievement rate: PDEF (2008) Repetition rate: World Bank (2008)

Table 2: Completion rates 1991 - 2008

ANNEES	COMPLETION RATES	
	Primary (CFEE)	Secondary (BAC)
1991		42,0
1992	26.0	34,5
1993	29.1	37,5
1994	21.4	Nd
1995	39.1	Nd
1996	24.4	43,8
1997	27.4	42,4
1998	27,3	45,5
1999	30,4	Nd
2000	46,8	Nd
2001	50,4	37,7
2002	45,3	35,1
2003	50,4	44,2
2004	45,1	46,1
2005	47,3	45,5
2006	69,4	50,2
2007	55,9	46.0
2008	70,7	41.8

Sources: Ministère de l'Education Nationale (D.P.R.E) / Statistiques Scolaires et Universitaires ;CREA/ "Revue des dépenses publiques dans le secteur de l'Education"

Repetition and dropouts in primary school.

Repetition and dropout before completing the primary school cycle remains a challenge in Senegal as in most of African countries. This raises the issue of access and retention in schools which affects the primary school completion. This is more severe in rural areas than in urban areas (Diagne and Daffe, 2001 ; PDEF, 2008; tables 1 and 5).

The national target for reducing repetition and dropout rate was set at 5% by 2010. According to Diagne et Daffé (2001), Senegal noted an average total repetition rate of 15.6 % in the period 1992/93 to 1995/96 with 16.1% for girls. During the first seven years of the 2000s, (World Bank, 2008), the general average repetition rate in the primary school (percentage on the total enrolment) on the period 2000 to 2006 declined to 10.5% (**table 1**). The rate for girls is 10.7% less than that for boys which is 10.4% in 2008. The completion rate in the primary school is less than that for boys. This also reflects the low enrolment rate for girls in the first year of the primary school.

The repetition rate reduced in 2006 but remain high relative to the national target. It is estimated by PDEF (2008) that for a 100 children in school, 7.9 % repeated while 10.9%

tended to abandon schooling. Looking at this per year, it is observed that the repetition trend tends to increase from 11.28% in the first year to 13.4% for the fourth year. It is really high in the last two years of primary schooling (CM1 and CM2) highest in the last year CM2 with an average of 30.4% on the period 1992/93 to 1995/96 (table 3).

Table 3: Repetitions for primary schooling from 1992/93 to 1995/96

	92/93	93/94	94/95	95/96	Average
CI	11	11,6	11,1	11,4	11,28
CP	11,5	12,3	12,12	11,6	11,9
CE1	12,6	12,9	12,7	13,2	12,9
CE2	13,5	13,6	12,9	13,4	13,4
CM1	16,2	17,4	16,7	16,5	16,7
CM2	28,8	31	30,3	31,4	30,4

Source: PDEF (2008)

As described in PDEF (2008), the situation did not change in 2007 where the repetition rate increases from the first year (CI), 4.0% to the last year (CM2), 17.21%. On the other hand, it is noted that the dropout rate was high in the first year of the primary school (14.69%) and in the fifth (CM1, 15.17 %) and sixth years (CM2, 22.2 %) (**Table 4**).

Table 4: School flow per year of studies in 2007 in percentages

Flow rate	1 st Stage		2 nd Stage		3 rd Stage		Global
	CI	CP	CE1	CE2	CM1	CM2	
<i>Promotion rate</i>	-	81.31	87.68	84.28	90.25	77.31	81.19
<i>Repetition rate</i>	4.00	7.73	5.85	8.77	7.52	17.21	7.91
<i>Dropout rate</i>	14.69	4.59	9.86	0.98	15.17	22.27	10.90

Source: PDEF (2008)

This table 6 is calculated by adding up all the total number of drop out in each class through the period, and finding the number of dropout in each class relative to the total in the education cycle. Hence, it is observed that the first school year (C1) tend to have the least number of dropouts and the last year (CM2) the largest number of dropout.

In the first year, most of pupils abandon the school because of, among other reasons, the long distance to school particularly in the rural areas. For the last two years, this can also be explained by the difficulties of covering the national school syllabus; also by the high repetition rates due mainly to failure in the final examination organized yearly in CM2. The examination is national with all schools taking the same examination.

Table 5: Total number of Dropouts from 92/93 to 95/96 and 2006 in percentages

Years / Classes	92/93	93/94	94/95	95/96	Average (92/93-95/96)	2006
CI	4,10	5,75	8,53	27,89	11,57	17,4
CP	7,61	5,82	5,45	3,78	5,67	6,6
CE1	9,40	7,91	5,15	7,98	7,61	8,7
CE2	6,47	5,15	9,31	6,97	6,97	4,3
CM1	15,05	6,69	5,88	4,91	8,13	15,6
CM2	57,37	68,68	65,68	48,47	60,05	47,4
TOTAL	100,00	100,00	100,00	100,00	100,00	100,00

Source : Diagne et Daffe (2001) and UNESCO 1999 and 2007

6. Literature review

The relation between the educational expenditure and outcomes has been well studied and there has been no agreement on the effectiveness of education expenditures on the outcomes.

Al-Samarrai (2003, 2004) study shows the relationship between education resources and educational outcomes to be weak in cross-country analysis. Furthermore, in discussing whether increases in expenditures as from the 1990s can result to attaining the EFA primary education target shows that the relationship between resources and education outcomes is weak. Does this mean that increase spending on education is not important? Improving access to education particularly in developing countries requires the construction of new schools, more classrooms, training and recruiting more teachers, providing more school inputs such as school textbooks. Hence more resources are definitely needed.

To bring out the relationship more clearly, there was further analysis of three country study – Botswana, Malawi and Uganda. These are some of the countries having some success in attaining universal primary education. Also the three country study confirms the cross country study of the weak link between public spending and educational outcome especially primary school access. There has been some explanation given to these. During primary school expansion, there tends to be an increase in quantity at the expense of quality.

Al-Samarrai (2002) uses cross section data on primary school gross and net enrolment rates as quantity of education. And for school quality he used the survival rate to grade five and primary school completion rate with the explanatory variables including public spending on primary education as a portion of GNP, primary education expenditure per pupil, the pupil/teacher ratio in primary schools. His results were not very convincing. He put that on the quality of data and the omitted variables. Some of the omitted variables included what the household spends on education and “effectiveness school management”. According to the study the weak relationship may be because of three

factors: i) “poor data, ii) failure to account for other factors such as household spending, and iii) efficiency of public spending across countries”. But the effectiveness of school management is difficult to capture. The point he makes is that the composition of expenditures, the institutions managing the use of the resources are crucial in transforming the resources into better education outcome. More stress should be put on these aspects of the educational system.

This quantity-quality trade-off means that the boost in access to primary school is driven by more intensive use of the education infrastructure such as buildings, classrooms, teachers, teaching materials, etc. as the enrolment increases; instead of also having an increase in the number of places provided by the educational system. This happened to be the case of Malawi and Uganda. The enrolment rates as an important outcome do not accurately measure children regular attendance in schools or classes. There are cases where the enrolment rates are quite high but the attendance is not very regular to produce effective learning. Another issue is the composition of expenditure on education. Much of the expenditure is carried out at the level of administration of the overall system rather than at the school level. The administration is important but expenditure at school level seems to produce more effective learning.

The literature so far has provided important methodological improvements and extended to inputs, test scores and include the school systems representation, which may be more complex. Aggregate measures of quantity and quality of education may produce little robust results, so the shift to micro-study. On cross country studies, test score variable regressed on variables representing education/school resources and country characteristics, but changes in resources do not have any significant impact on test performance. On the contrary, in the review by Leclercq, (2005) studies show that school resources impact significantly on test scores. Lee and Barro’s (2001) econometric results on repetition and dropout rates show some consistency with significant impact of school resources – pupil-teacher ratio with a positive and significant impact on the repetition and drop out rates, although some regression results show teachers’ salaries having a strong, negative impact. They (Lee and Barro, 2001, p485) conclude that “school inputs especially smaller class sizes but probably also higher teacher salaries and greater school length enhance educational outcomes”.

Glewwe (2002) discusses three main issues in reviewing the literature on relationship between teacher and school characteristics with cognitive skills acquisition. That is finding out the school policies that are most cost-effective; the relationship between schooling and labour productivity – stressing on cognitive skills; and the impact of different skills on income and other socioeconomic outcomes. According to him, cognitive skills rather than years of schooling tend to be the fundamental determinants of wages; as better educated persons tend to have higher income. “The most direct interpretation of this correlation is that the cognitive skills acquired in school are an important component of individual human capital, and the return to that capital in the labour market leads to higher income” p466. But due to the dearth of data, there has been little research on the relationship of between cognitive skills and income.

According to Das et al (2004) households do respond optimally when changes are made in school inputs. They study how such responses affect the link between school inputs and cognitive achievement. And examining the relationship between the household educational spending and school cash grants as substitutes in a production function for cognitive achievement when inputs are unanticipated, they found a positive impact.

Remarkable progress have been made in expanding school enrolment and raising schooling years, but many children of schooling age are still not enrolled in school. Parents usually face high private cost for sending their children to school – the cost may be related to school fees, required school inputs such as textbooks, uniforms, etc. School fees and related costs have been a great hindrance to many children attending/going to school. It is evidenced that in 1997 in Uganda, when free primary school was introduced, the school enrolment more than doubled; a similarly situation occurred Tanzania in 2002 and in Kenya, (Glewwe, and Kremer, 2005). Hence removing school fees leads to large enrolment response. But many things may be going on when school fees are eliminated. These could include over reporting by school authorities. Furthermore increasing in enrolment without the provision of necessary school infrastructures and facilities tend to compromise the school quality. The pupil-teacher ratio tends to increase with no proportionate increase in teachers' incentive, the number of classrooms tends to be inadequate, and the pedagogic material may not be enough with sharp increase in the number of school children. In developing countries the school quality is still low, high rate of repetition, and drop out at early age, teachers' absenteeism is common, children learning less than it is set out in the school curriculum; most of the schools do not have the basic equipment and school supplies such as desks, benches, textbooks, blackboards particularly in the rural areas of the country. These, among other things, may tend to reduce the quality of schooling, (Glewwe, and Kremer, 2005).

Large classes, low or weak teachers incentives, low qualifications of some of the teachers tend to lower schooling quality. Shortages in building and increased number of pupils mean double shifts system in some cases. Many developing countries are faced with enormous problems including being taught in language which is not in their mother tongue, educational system still based on foreign education system, which were developed during the colonial period. Heterogeneous school quality, educational background, language all contribute to poor education performance. For instance, the study of Glewwe and Kremer (2005) show that in Tanzania for the period 1997 – 2001, for those who registered for the examinations, only 22 % passed the primary education final examination and 28 % passed the certificate of secondary education examination. In general schools in developing countries may vary from country to country but many of the school systems are very centralized with poor teacher incentives. In some of the highly centralised school systems, the highly experienced primary school teachers tend to mainly involved in school administration, instead of teaching, (Noumba, 2008).

Case and Deaton (1999) investigate the link between educational inputs and school outcomes in South Africa, when Blacks were very restricted in their residential choice during the apartheid era. Using linear probability models for enrolment status as the dependent variable, they find that the black resource poor schools do not encourage

educational attainment on age, lower test scores and lower the probability of being enrolled in school. A resource poor school is regarded as schools with high pupil/teacher ratio; in black schools the ratios are more than twice as high as those of the white schools. The education of the black is hindered by lack of financial resources – many black children not in school said, that was due to lack of financial resources. In discussing the relation between expenditure and class size, it should also be noted that changing class size or its composition has cost implication in the main form of teacher salary, equipment, school material and infrastructure.

Within the education production function conceptual framework, the relationship between schooling inputs and test score as outcomes for pupils, an analogy is made between a firm production process and the process of knowledge acquisition of the human being. The aim is to have an understanding of how the school inputs are combined technologically to generate cognitive achievement outcomes (Case and Deaton, 1999). The standard production theory focuses on quantities of a homogeneous output. But this is different with education. Educational production function studies general measure output by standardized achievement test scores. Studies within the framework of educational production function include observed student outcomes from school, students and their families' characteristics, with student outcomes frequently measured by various standard test scores. With such differences, the results of such studies are necessarily different and sometimes contradictory (Hanushek 1979). An understanding by using the production function conceptual framework entails enormous data on the school and family characteristics, which are usually not readily available.

But a relationship between these different types of expenditures and outcomes also reflects the interactions between pupils and teachers. The interactions are not usually well captured in these studies. Hence, it (Leclercq,2005, p6) has been stated that “any estimation of the relationship between education expenditures and outcomes faces the need to take crucial unobservable variables into account: information about the level and distribution of education expenditures does not provide a complete representation of the school system. School systems, besides resources, consist of incentives, values political and cultural values embedded in the school systems.” Using educational production function only gives a technical relationship between outputs and inputs and does not specify a behavioural relationship.

Still on education production function- evidence shows that total expenditures per pupil or different specific inputs have little impact on outcomes, but this may be because of conceptual and methodological problems or poor allocation of expenditures and management practices as the changes in expenditures do not explain the variance in outcomes in the countries studied. The literature on incentives seems to show that outcomes could be improved without having to increase spending. But incentive offered to teachers given various employment conditions, decentralization of school financing, privatization of educational provision also involved spending. Generally this literature does not directly show the link between expenditures and outcome. But how inputs are used may show how that impact on the outcomes.

In general, gross enrolment rate (GER) has been the policy target for improvement. But it seems GER tends to measure the capacity and output as such it is a measure of school places filled. The enrolments include also repeaters and over-age children and therefore, may tend to overstate participation by the age cohort at the primary school level. So also the number of children out of school may pose more problem of non-enrolment because of net enrolment calculation does not include over age children as they start and complete late. As governments seek to implement education for all, schools are being made more accessible. School attendance will then tend to rise as over- aged children make use of the opportunities being offered. The Net Enrolment Rate (NER) is the proportion of school age children going school. This seems to be a better measure than GER, as it gives less weight to repeaters and attendance of non school-age children. NER is usual about 10 -20 percentage points less than the GER (Roberts, 2003). However, NER is not available in many African countries, and the MDG does not specify children's age when they complete primary school. Some authors focus on enrolment rates and retention of pupils in school until grade four and the interpretation is taken as a proxy for achievement. They find that the portion of primary and secondary education expenditure in total expenditures has a positively significant impact.

Primary school completion rate (PCR) can be taken as a measure of progress towards achieving the MDG target. The World Bank estimates it as “ratio of number of children completing the final year primary education cycle to the size of the final year primary age cohort”. High drop out rates are often related with the high rates of over-age enrolment and so bias on enrolment rates.

Adult literacy is often used as a measure of educational performance and it is characterized as an educational outcome since literacy is a skill that gives direct potential for higher earnings than those who are not literate. Progress in literacy in SSA has not been hindered by low primary school enrolments, although literacy rate tend to be positively correlated with enrolment rate (Roberts 2003).

It is difficult to come out with a theoretical framework on the relationship between education expenditure and educational outcomes. This failure of modelling and estimating/measuring the impact of education inputs on educational outcomes is equally complicated by the fact that education expenditures are across many sectors – primary, secondary, and tertiary educational sectors with different providers of education such as the public, private which may have centralized or decentralized systems and households high involvement. Inputs are varied ranging from spending on teachers' salaries, school/pedagogic materials, management with inspection to buildings. The inputs may also include school and teacher characteristics with different levels of aggregation – teachers, principals to ministers, while family inputs may also depend on behaviour. In fact outcomes also are very varied such that the definition tends to be extremely arbitrary. The initial stress on the impact of human capital through schooling on productivity led economics paying more attention on schooling years with other measures of attainment such as quantity of education and attainment like ‘cognitive skills’ such as basic literacy and numeracy and also the “mastery of language, mathematics and science which are relatively easy to quantify as test scores” (Leclerq, 2005 p5).

Difficulties in specification, data and estimation are issues which have made it hard to make concrete statements on the impact of expenditures on the educational outcomes. However, there have been some results from economic literature which have produced/showed the relationship between educational expenditures and outcomes with valuable policy inputs.

7. Model: Framework for additional analysis

Information is collated from the Statistical department of Ministry of Finance, Ministry of Education, the World Bank and other sources including published documents. The information from the national sources includes Labour market survey, Household surveys I & II, Statistical Department, ESAM I and II. The information is used to outline the expenditure trends and education outcomes. Non parametric and parametric estimates are also used to analyse the relationship between education expenditures and educational outcomes. That is both parametric and non parametric measures are adopted to achieve the objective of the study. This includes the use of ratios and regression analysis.

For this study, the econometric approach uses time series data on education and some macrodata; with the model specification based on the country situation and the relevant literature. The approach shows how public spending and other intervention influence education enrolment through the years. The relationship between educational expenditures and educational outcomes could be stated as outcome (being the explained variable) and as a function of expenditures and other explanatory variables. The explanatory variables include educational expenditures at different levels and other inputs, macro variables such as per capita income, family and school characteristics.

From the analysis and the discussion above, the following equation is used to further assess the relationship between educational expenditure and the outcomes with the main outcomes being enrolment and completion rates in the estimations.

$$OC_j = f(X_{it}, Z_{it}) \dots\dots\dots(1)$$

Where OC_i is the educational outcomes and $j = 1$ and 2 with enrolment rate (ENR) and completion rate (COM) respectively. X_{it} represents the variables as specified below. Z_{it} is vector of other variables. Depending on the total number of observations available for data set, the following models are estimated:

Dependant Variable is Primary school gross enrolment rate (ENR) and Primary school Completion rate (COM)

1. $ENR_t = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7)$
2. $COM = f(X_1, X_2, X_3, X_4, X_7, X_8)$

With X representing the following variables over time:

- X_1 = Per capita GDP in CFA Francs
- X_2 = Per capita GDP Growth
- X_3 = Ratio of Education Expenditure over GDP
- X_4 = Pupils /Teacher Ratio
- X_5 = Literacy rate (adults)
- X_6 = Current Education Expenditure / total number of primary pupils –unit cost (uc).
- X_7 = Education expenditure/ Total Public Budget

8. Results and analysis of results

Given the available data, three equations are estimated, two equations on the enrolment rates and one equation on completion rate. The first equation on enrolment rate produce some robust results with all the variables showing the anticipated signs, although the unit cost and the per capita GDP variables are not significant (table 6). The second equation gives some interesting results with the addition of the literacy variable (table 7). The pupil per teacher ratio and the unit cost variables become insignificant. This may be surprising that the education expenditure/GDP ratio does not show the anticipated sign. The limited number of observation on the variable on literacy rate also imposed a limit on the number of observation on the other variables particularly when the expenditure component was significantly increased. This may also show that the increase in expenditure might have resulted to poor utilization of resources. Some countries with lower share of their GDP devoted to education tend to have much better outcome than those countries with larger share of their GDP devoted to education. The results here show that the use of resources could be greatly improved and this could also increase the enrolment even without increasing spending. The third equation on completion rate does give also interesting results (table 8). Again the education expenditure/GDP ratio variable is negative and is significant. The pupil/teacher ratio is negative and significant, showing that as the number of pupils per teacher reduces, the completion rate tends to improve. Studies have generally show that smaller classes produce better results.

On the whole, the regression results show that enrolment significantly depends on per capita GDP, education, the number of pupils per teacher, the GDP growth rate, low unit cost and the literacy of the adults or the household. Anyanwu and Erhijakpor (2007) regressed enrolment rate on education expenditure and other variables for a number of countries, the results show that raising the level of expenditure would significantly increase the enrolment. On the other hand, when the pupil-teacher ratio is large the completion rate tends to be lower. Smaller classes perform better as well as literacy adults tend to have positive influence on school completion.

Table 6: Equation 1: Determinants of Enrolment Rate (ENR)

Dependent Variable: ENR				
Method: Least Squares				
Sample (adjusted): 1970 - 2005				
Included observations: 36 after adjustments				
	Coefficient	Std. Error	t-Statistic	Prob.
C	8.240943	3.866888	2.131156*	0.0414
Per capita GDP (X ₁)	0.000134	3.77E-06	35.64167**	0.0000
Per_capita_GDP_growth (X ₂)	0.060591	0.048894	1.239253	0.2249
Educ exp/GDP (X ₃)	2.094320	0.842264	2.486537**	0.0187
Pupil/teacher ratio (X ₄)	0.322487	0.054543	5.912508*	0.0000
(uc) ed exp/ total pupils (X ₆)	-7.92E-06	4.29E-06	-1.848223	0.0744
Educ exp/Total pub budget (X ₇)	0.021423	0.042962	0.563986	0.8524
R-squared	0.985658	Mean dependent var		58.85556
Adjusted R-squared	0.983268	S.D. dependent var		15.00092
S.E. of regression	1.940426	Akaike info criterion		4.314704
Sum squared resid	112.9576	Schwarz criterion		4.578624
Log likelihood	-71.66467	Hannan-Quinn criter.		4.406819
F-statistic	412.3501	Durbin-Watson stat		1.097676
Prob(F-statistic)	0.000000			

*: Significant at 5%; **: Significant at 1.0%

Table 7: Equation 2: Determinants of Enrolment Rate (ENR)

Dependent Variable: ENR				
Method: Least Squares				
Sample (adjusted): 1991 2005				
Included observations: 15 after adjustments				
	Coefficient	Std. Error	t-Statistic	Prob.
C	51.90688	10.89792	4.763010**	0.0014
Per capita GDP (X ₁)	5.56E-05	1.67E-05	3.320935**	0.0105
per_capita_GDP_growth (X ₂)	0.088364	0.027498	3.213419**	0.0124
educ exp/GDP (X ₃)	-0.436647	0.968520	-0.450839	0.6641
Pupil/teacher ratio (X ₄)	0.021962	0.034703	0.632868	0.5445
(uc) ed exp/ total pupils (X ₆)	-5.92E-05	6.91E-05	-0.857663	0.4160
Literacy rate (X ₅)	0.216510	0.104938	2.063221*	0.0730
R-squared	0.992920	Mean dependent var		73.90000
Adjusted R-squared	0.987609	S.D. dependent var		6.260990
S.E. of regression	0.696934	Akaike info criterion		2.420472
Sum squared resid	3.885734	Schwarz criterion		2.750895
Log likelihood	-11.15354	Hannan-Quinn criter.		2.416952
F-statistic	186.9795	Durbin-Watson stat		2.359681
Prob(F-statistic)	0.000000			

*: Significant at 5%; **: Significant at 1.0%

Table 8: Equation 3: Determinants of Completion rate.

Dependent Variable: COMPLETION_RATE				
Method: Least Squares				
Sample (adjusted): 1991 2005				
Included observations: 15 after adjustments				
	Coefficient	Std. Error	t-Statistic	Prob.
C	116.7253	50.50488	2.311170*	0.0434
Per capita GDP (X ₁)	3.95E-07	5.74E-05	0.006878	0.9946
per_capita_GDP_growth (X ₂)	0.285831	0.194025	1.473170	0.1715
educ exp/GDP (X ₃)	-14.23876	7.102441	-2.004771*	0.0728
Pupil/teacher ratio (X ₄)	-0.611550	0.270197	-2.263351*	0.0471
Literacy rate(X ₅)	0.22720	0.13412	1.69400	0.1405
R-squared	0.813173	Mean dependent var		35.66000
Adjusted R-squared	0.738443	S.D. dependent var		10.83914
S.E. of regression	5.543424	Akaike info criterion		6.524303
Sum squared resid	307.2955	Schwarz criterion		6.760320
Log likelihood	-43.93227	Hannan-Quinn criter.		6.521789
F-statistic	10.88139	Durbin-Watson stat		2.660110
Prob(F-statistic)	0.001153			

*: Significant at 5%; **: Significant at 1.0%

9. Policy implication and conclusion

Much progress has been made towards UPE, with raising rates of enrolment in primary education tending to be distorted by high rates of attendance and repetition of over aged children Goal Two of the MDGs does not distinguish between gross and net enrolment. It is more concerned with gross enrolment although the gross enrolment rates as an important outcome do not accurately measure children regular attendance in schools or classes. There are cases where the enrolment rates are quite high but the attendance is not very regular to produce effective learning. Yet getting the children through the primary school system seems to be an objective.

Much of the expenditure is carried out at the level of administration of the overall system rather than at the school level. The administration is important but expenditure at school level seems to produce a greater outcome, so it is important to effectively decentralize expenditures; as carrying out expenditure at the school level no matter where the schools are located tend to be more effective.

Higher public expenditure on primary education is mostly justified on the lifetime income of individuals as World Bank studies have found that the primary education shows the highest rate of social return relative to secondary and tertiary education. But it must be noted that within the education system, secondary and tertiary education are equally important. They are also inputs into the educational system including the primary education sector.

Policy makers have become more keen on the composition of public expenditures; as it has been known that proper spending on education and health do promote equity, reduce poverty and increase growth (Gupta et al. 1997, 2002). Eliminating unproductive/wasteful expenditures, improving the quality and composition of expenditures is important for educational spending outcome. This means that there must be education reforms as well as changing the cost structures so as to make education affordable. School enrolment can be increased by reducing schooling cost and providing incentives for school attendance. In fact, education expansion has been from a very low base, showing that there is greater room for more improvement. In 1970 the enrolment rate was only 38.8 % but by 2007 it rose to 86.5%. More effective and efficient spending will significantly improve the primary school enrolment.

The completion rate for girls tends to be less than that for boys probably indicating the need to take some measures to address some challenges in promoting the education of girls and women. In fact, the target of achieving primary education for all (EFA) by 2015 may be hindered mainly because of inefficient and ineffective in education spending. There is a need to examine thoroughly unit costs of schooling and the type of spending. There is a great need to reduce unit costs, e.g. by increasing class sizes, having double-shifts, using teaching assistants and having in-service training – training on the job; also, deploying trained teachers more efficiently, reallocating expenditure to where there are greater impact particularly in quality such as in the provision of textbooks and other pedagogic materials. This will tend to achieve both qualitative and quantitative educational goals.

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Annex 1: Gross enrolment by region and country income group

	<u>1965</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1997</u>	<u>1999</u>
East Asia and Pacific	88.0	89.8	114	110.6	118.5	120.1	119.0	105.7
Europe & Central Asia	..	..	..	99.3	102.5	98.3	100.0	94.1
Middle East & North Africa		70.1	82.0	86.6	92.00	95.8	95.00	95.4
Latin American & Caribbean	98.0	107.3	98.8	104.8	105.3	105.6	113.0	131.0
South Asia	68.0	70.6	75.0	76.7	86.4	90.4	100	100.8
Sub-Saharan Africa	41.0	51.0	59.4	80.3	76.0	74.5	78.0	79.3
Least Developed countries (UN)	..	48.2	57.8	68.3	64.6	67.4	..	..
Low Income	73.0	66.0	73.2	82.9	88.4	88.5	97.0	97.9
Lower middle income	88.0	90.1	113.9	107.5	114.7	116.3	120.0	103.8
Upper middle income	98.0	106.0	99.8	101.6	103.6	104.6	109.0	127.7
World	85.0	85.4	95.1	96.9	101.6	102.3	106.0	

Annex 2: Enrolment and Completion Rate in 1999 by Region and country income group

	<u>PER</u>	<u>GER</u>	<u>NER</u>
East Asia and Pacific	81.0	105.7	92.4
Europe & Central Asia	93.0	94.1	92.0
Middle East & North Africa	74.0	95.4	83.1
Latin American & Caribbean	83.0	131.5	97.0
South Asia	56.0	100.8	79.0
Sub-Saharan Africa	55.0	79.3	54.4
Low & middle income	73.0	103.7	82.0
Low income		97.9	66.4

Source: EdStats, NERs for LMICs & S. Asia; UNESCO

Sources: Roberts (2003)

Annex 3: Adult Literacy

	<u>1970</u>	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>2000</u>
East Asia and Pacific	44.0	37.4	31.0	25.4	20.8	14.2
Middle East & North Africa	70.2	64.3	58.4	52.3	46.2	35.2
South Asia	68.1	64.5	60.7	56.8	52.9	45.2
Sub-Saharan Africa	72.0	67.2	61.9	56.1	50.2	38.5
Least developed countries	72.2	68.6	64.9	60.7	56.4	47.0
Low income	61.2	57.4	53.5	49.5	45.4	37.6
Lower middle income	39.9	34.8	29.6	25.0	21.2	15.3
Middle income	36.3	31.6	27.0	23.0	19.5	14.1
Upper middle income	23.6	20.6	18.0	15.7	13.7	10.2

Sources: Roberts (2003)

Annex 4: Public expenditure on education as a percentage of GDP

	1970	1975	1980	1985	1990	1995	1998
Middle East & North Africa	3.9	5.1	4.9	5.9	5.3	4.7	
South Asia	1.7	2.2	2.0	2.7	2.6	3.1	
Sub-Saharan Africa	3.7	3.4	3.5	2.9	3.4	4.2	3.6

Source : World Development Indicators

Annex 5: Public expenditure on education as a percentage of total public expenditure (1995)

Region	Two lowest	Two highest
Sub-Saharan Africa	Zambia (7.1%) Nigeria (11.5)	Senegal (33.1) Côte d'Ivoire (28.8)
Latin America & Caribbean	Jamaica (7.7) Guyana (8.1)	Mexico (23.0) Panama (22.1)
Central, East & SE Asia	Indonesia (7.8) Maldives (10.5)	Singapore (23.4) Kyrgyzstan (23.1)
South Asia	Pakistan (7.8) Sri Lanka (8.1)	Nepal (14.0) India (11.6)
Middle East & N Africa	Lebanon (8.7) Syria (11.2)	Morocco (24.7) Jordan (21.4)

Source : UNESCO

Annex 6: Public current expenditure per pupil (primary + secondary) in 1996-1997 by region (US\$ at current exchange rates)

Sub-Saharan Africa	Arab States	Latin America & Caribbean	Eastern Asia & Oceania	Southern Asia
Total \$252	Total: \$416	Total: \$465	Total: \$182	Total: \$64
Excl. tertiary: \$190	Excl. tertiary: \$332	Excl. tertiary: \$392	Excl. tertiary: \$136	Excl. tertiary: \$44
Highest: S. Africa \$942	Highest: Qatar \$3456	Highest Argentina \$1191:	Highest: Malaysia \$1039	Highest: Sri Lanka \$112
Lowest: Sudan: \$30	Lowest: Yemen \$107	Lowest: Guatemala \$ 137	Lowest: Cambodia \$40	Lowest: Nepal \$31

Source UNESCO and author's calculations

NB: Regional average unweighted; country coverage in source incomplete

Annex 7: DATA FOR REGRESSION (GROSS ENROLMENT RATE (ENR))

Years	ENR	Percapita GDP (CFAF)	Per capita GDP Growth	Educ. Exp. / Total Public Exp.	Educ.Exp /GDP
1970	38.8	54948.45	0.35	20.8	3.2
1971	38.8	55139.91	8.05	20.4	3.2
1972	38.8	59577.35	-0.81	22.5	3.3
1973	38.8	59096.15	18.70	21.7	3.5
1974	38.8	70146.30	17.11	25.6	3.7
1975	40.0	82150.66	10.29	26.2	3.9
1976	40.0	90604.35	2.58	26.6	4.3
1977	40.0	92939.10	-0.07	25.4	4.3
1978	43.6	92878.61	14.40	26.5	4.8
1979	44.8	106250.90	12.19	27.0	4.6
1980	46.3	119198.99	22.78	23.6	4.3
1981	48.2	146348.78	8.46	25.0	3.6
1982	51.0	158728.67	5.35	26.8	4.0
1983	52.9	167221.65	10.50	25.3	4.0
1984	54.3	184783.41	9.63	26.1	3.8
1985	55.7	202584.27	3.39	26.5	3.8
1986	57.1	209447.25	4.57	25.2	3.6
1987	58.5	219017.63	-2.55	24.4	3.5
1988	59.9	213437.17	4.87	24.6	3.6
1989	61.3	223825.40	2.76	27.3	3.8
1990	62.7	230008.94	-4.66	29.1	3.8
1991	64.1	219286.56	-6.07	32.0	4.2
1992	65.5	205983.40	-6.16	20.4	4.2
1993	66.9	193295.93	28.03	21.4	4.7
1994	68.3	247481.47	7.56	19.6	4.1
1995	69.7	266181.60	3.94	31.5	3.5
1996	71.1	276679.76	4.73	34.0	3.7
1997	72.5	289753.68	4.66	30.7	3.5
1998	73.9	303245.02	3.72	34.3	3.5
1999	75.3	314529.03	3.30	32.3	3.4
2000	76.7	324913.79	12.26	30.2	3.0
2001	78.1	364743.66	2.26	32,1	3.0
2002	79.5	372982.82	5.53	32,4	3,1
2003	80.9	393609.32	1.82	32,8	3,1
2004	82.3	400774.19	4.45	33,2	3,2
2005	83.7	418612.82	0.35	33,6	3,2
2006	85.1			34,0	3,2
2007	86.5			34,3	3,3

Source:PDEF, 2008; Ministère de l'éducation Nationale (DPRE), Centrale Statistiques Nationales, Statistiques scolaires MEN/DPS/UNESCO de 1970 à 2000 ; World Bank, 2008

Annex 8: DATA FOR REGRESSION - (Cont.) (GROSS ENROLMENT RATE (ENR))

YEARS	PUPILS/TEACHER RATIO (PTR)	UNIT COST (CFAF)	LITERACY RATE	COMPLETION RATE
1970	45.0	13294.1		
1971	45.2	18240.7		
1972	44.1	20515.0		
1973	45.8	20531.2		
1974	40.8	21074.7		
1975	41.5	29374.4		
1976	41.2	35256.6		
1977	45.8	36422.0		
1978	42.3	35021.7		
1979	42.9	36864.4		
1980	42.8	46825.7		
1981	42.6	50482.7		
1982	40.0	56072.8		
1983	43.6	30701.6		
1984	41.2	30630.3		
1985	46.1	37661.0		
1986	46.5	39557.1		
1987	47.5	36278.2		
1988	49.9	34502.8		
1989	51.2	35872.9		
1990	53.7	35790.2		
1991	52.9	37443.2	35.0	24.5
1992	54.2	30081.5	35.9	26.0
1993	53.7	29785.1	37.3	29.1
1994	53.6	35613.5	39.5	21.4
1995	54.4	30976.6	39.5	39.1
1996	57.7	31847.9	39.8	24.4
1997	61.6	39047.5	40.4	27.4
1998	69.0	41129.9	47.2	27.3
1999	48.6	38778.1	48.6	30.4
2000	53.1	42624.2	51.1	46.8
2001	50.8	36554.5	53.6	50.4
2002	41.5	43527.5	54.1	45.3
2003	44.5	47957.4	56.5	50.4
2004	43.7	50756.9	59.0	45.1
2005	41.6	62088.6	61.7	47.3
2006		65951.1	64.3	69.4
2007				55.9

Source: PDEF, 2008; Ministère de l'éducation Nationale (DPRE), Centrale Statistiques Nationales, Statistiques scolaires MEN/DPS/UNESCO de 1970 à 2000; World Bank, 2008

Annex 9: DATA FOR REGRESSION – cont (*COMPLETION RATE (COM)*)

YEARS	Educ. Exp. / Total Public Exp.	Total Expenditures (TE)	Total of Primary Pupils (TPP)
1970	20.8	36954	257708
1971	20.4	39518	262928
1972	22.5	40759	269997
1973	21.7	45257	283276
1974	25.6	48695	297560
1975	26.2	60313	308466
1976	26.6	74577	311913
1977	25.4	81652	345862
1978	26.5	90976	346585
1979	27.0	100526	370412
1980	23.6	122690	392541
1981	25.0	122443	419748
1982	26.8	139762	452679
1983	25.3	159883	496066
1984	26.1	170200	533394
1985	26.5	185845	567059
1986	25.2	195765	583890
1987	24.4	210532	610946
1988	24.6	214407	642063
1989	27.3	222037	658102
1990	29.1	221848	682925
1991	32.0	215751	708299
1992	20.4	326100	725496
1993	21.4	337467	738556
1994	19.6	418090	773386
1995	31.5	247602	875661
1996	34.0	256670	954758
1997	30.7	289708	1026570
1998	34.3	278008	1034065
1999	32.3	308463	1107712
2000	30.2	307043	1110214
2001	32,1	323672	1159721
2002	32,4	333598	1197081
2003	32,8	343524	1287059
2004	33,2	353450	1382749
2005	33,6	363376	1444163
2006	34,0	373302	1487845
2007	34,3	383228	
2008	40.0		

Source:PDEF, 2008; Ministère de l'éducation Nationale (DPRE), Centrale Statistiques Nationales,
Statistiques scolaires MEN/DPS/UNESCO de 1970 à 2000 ; World Bank, 2008 ;

Annex 10: DATA FOR REGRESSION - (Cont.) (COMPLETION RATE (COM))

YEARS	TE/TPP (in CFAF)	CAPITAL EXPENDITURES (CE)	CE/TPP (in CFA)
1970	143394,85	7340	28481,85
1971	150299,70	7744	29452,93
1972	150960,94	8517	31544,79
1973	159762,92	9290	32794,87
1974	163647,67	11417	38368,73
1975	195525,60	13927	45149,22
1976	239095,52	16311	52293,43
1977	236082,60	190098	549635,40
1978	262492,61	20415	58903,30
1979	271389,70	23616	63756,03
1980	312553,34	26312	67029,94
1981	291705,98	28309	67442,85
1982	308744,17	34719	76696,73
1983	322301,87	38600	77812,23
1984	319088,70	43100	80803,31
1985	327734,86	46080	81261,39
1986	335277,19	47080	80631,63
1987	344600,01	48030	78615,79
1988	333934,52	50130	78076,45
1989	337389,95	54730	83163,40
1990	324849,73	60530	88633,45
1991	304604,41	61600	86968,92
1992	449485,59	67010	92364,40
1993	456928,11	67100	90852,96
1994	540596,80	74777	96687,81
1995	282760,11	77820	88870,01
1996	268832,52	84437	88438,12
1997	282209,69	87403	85140,81
1998	268849,64	90370	87392,96
1999	278468,59	93337	84261,07
2000	276562,00	96303	86742,74
2001	279094,71	99103	85454,17
2002	278676,21	101909	85131,25
2003	266906,18	104716	81360,68
2004	255614,00	107522	77759,59
2005	251617,03	110329	76396,50
2006	250901,14	113135	76039,51

Source:PDEF, 2008; Ministère de l'éducation Nationale (DPRE), Centrale Statistiques Nationales;Statistiques scolaires MEN/DPS/UNESCO de 1970 à 2000 ; World Bank, 2008