RATES OF RETURN TO EDUCATION IN BOTSWANA: RESULTS FROM THE 2002/2003 HOUSEHOLD INCOME AND EXPENDITURE SURVEY DATA SET

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Abstract

Using the most recent Household Income and Expenditure Survey data (2002/2003), this paper presents current rates of return to education for Botswana. The results show that the rates of return have in general declined by one percentage point on average between the periods as shown in Table 2. If we, however, look at the averages for the different school cycles, the fall in the average rates is quite significant at about six percentage points between the periods. The biggest fall is for secondary education, especially upper secondary education, which fell by 28 percentage points between the periods. The rates of return to tertiary education, however, rose by more than 50 percentage points. Ignoring upper secondary, the pattern of rates of return has remained similar to the results of the study based on the 1993/1994 data. Rates are higher for tertiary education and lower for secondary than for primary education. This results are still consistent with rates of return generally rising with level of education. At policy level, the results continue to support sharing of costs between Government and beneficiaries or their parents especially at tertiary education level. Second, the results indicate the need for the country to continue to vigorously pursue job creation and reorient the education system from emphasis on white collar jobs.

JEL Classification: I21, J31
Keywords: Botswana, education, labour, income inequality, poverty

1. INTRODUCTION

One of the main means of reducing poverty in a sustainable way is through education and employment. World Bank and other International Development Agencies were for some years emphasising primary education as a means to poverty alleviation as well as serving other economic development purposes. The direct way in which education was to serve as a poverty alleviation tool is, though, its perceived impact on increased productivity of the educated compared with those with fewer years of education. Because the educated are perceived to be more productive, they are paid more and therefore have more chances of escaping poverty. This is the basis of the Human Capital model, which was used to guide the human resource development strategies of most of the developing countries including those in Africa. The presumption was that as more children of the poor enrol in education, that provides them with a window to escape from poverty through productive employment and self employment.

There are a number of contesting views to this thesis of education leading to poverty reduction. Some of the critics argue that children of the poor are more likely to drop out

of school early because of hidden costs to education. These costs include opportunity cost of labour, distance to schools, costs of uniform, feeding fees, *etc.* Most of the children from poorer families, according to these critiques, do not make it to higher levels of education; they in fact drop out in primary and lower secondary education. And yet these levels of education have very low chances of employment in the current labour markets of Africa. The current labour markets are such that there has been an excess of labour supply, which has tended to escalate the minimum requirements for most jobs. Jobs that previously required only a Primary school certificate now require upper secondary and sometimes even university education. In Botswana, for instance, the unemployment has risen to a high of 23.8% in 2002/2003 compared with 21.6% in 1996 and 14% in 1991 (CSO, 2004; Siphambe, 2005).[1]

The purpose of this paper is to look at the link between earnings and education using the latest Household Income and Expenditure Survey (HIES) data of Botswana. We also measure the profitability of the different levels of education with a view not to only guide education financing policy but also to assess whether education in Botswana has been income equalising and whether it has led to significant poverty reduction. We also compare the rates of return from the HIES 2002/2003 data with those done using the 1993/1994 HIES data reported in Siphambe (1997) and (Siphambe, 2000). Given the two data sets we are able to compare the two periods in terms of the rates of return with a view to provide an analysis of what the likely long-term trend could be if labour market conditions in Botswana continue to tighten. This also provides a test of the pattern of rates of return in Botswana over time and between education levels.

In the 1980s and 1990s George Psacharopoulos produced comprehensive reviews of rates of return to education in developed and developing countries (Psacharopoulos, 1981, 1985, 1989, 1994).[2] On the basis of his calculation of aggregate rates of return to education, Psacharopoulos showed that the following pattern of rates of return to education is discernible throughout the world:

(a) The returns to education are higher in the private sector than the public sector supporting the productivity-enhancing role of education in the private sector and some screening role and compressed pay structure in the public sector;
(b) Returns decline by level of schooling reflecting diminishing returns to schooling, *i.e.* returns to primary schooling are higher than secondary education, and the latter is higher than returns to higher education;
(c) The pattern of rates of return remains stable as countries develop with only relatively minor declines;
(d) Rates of return in developing countries (especially Africa) are higher than in advanced market economies;
(e) Returns to education for females are higher than for males because of their lower forgone earnings as reflected by their lower wages.

Bennel (1996) argued that Psacharopoulos' conventional rates of return patterns almost certainly do not prevail in Sub-Saharan Africa under current labour market conditions. Questioning the problems emanating from aggregation (*e.g.* different methodologies by authors, different country sizes and economic circumstances, data

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[1] Unemployment is now currently estimated at 17.5% from the 2006 Labour Force Survey.
[2] See Psacharopoulos (1994) for a summary of those patterns of rates of return.

quality, *etc.*), Bennel argued that we should dispense altogether with simple aggregate rates of return to education and look for a pattern at country level. Following Bennel, Siphambe (1997, 2000) showed that the pattern of rates of return to education in Botswana differs with the Psacharopoulos pattern especially on the returns by level of education. In Botswana, the returns were found to rise with level of education rather than declining.[3] Given that the only estimation done was using the 1993/1994 data then, the hypothesis of whether rates of return are stable over time was not tested. A comparison of rates of return between these periods shows the long term effects of changes in labour market conditions on the rates of return in Botswana even though it is a period of only 10 years. These results should be useful in terms of showing how rates of return to education generally changed in similar countries in Africa, which are facing problems of rising unemployment.

2. METHODOLOGY

The model used is the Human Capital Model Developed by Mincer (1974) with some modifications. In this respect, education is seen purely as an investment in oneself during school and later through on the job training. We run OLS on earnings equation specified as follows:

$$\text{Ln Y} = a + b\text{Education} + c\,\text{Exp} + d\,\text{EXP}^2 + e$$

where: Y is the monthly earnings, education is the number of years of education completed by the individual, and Exp is the experience. As usual the coefficient of education, "b" is an estimate of the private rate of return to education. In order to estimate the rates of return to each level of education we estimate the equation below:

$$\text{Ln Y} = a + b\,(\text{dummy for Education}) + c\,\text{Exp} + d\,\text{EXP}^2 + e;$$

where we include a dummy for each level of education completed by individual i.[4] To calculate the rate of return for each level of education, we subtract the coefficient of the subsequent level from that particular level and divide by the number of years of schooling for that level of education. ie. the rate of return to the kth level of education (r_k) is estimated by subtracting the coefficient of D_{k-1} from that of D_k and dividing by the number of years of schooling at the kth level; *i.e.* $r_k = \dfrac{b_k - b_{k-1}}{n_k}$. For instance, for primary education the rate of return to that level is calculated as $r_{(\text{primary versus illiterate})} = \dfrac{b}{S_p}$, where S_p is the number of years it takes to complete primary education, which is normally 7 years in Botswana. The correct coefficients are estimated from $(e^{\text{coefficient}}) - 1$ to correct for an

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[3] Psacharopoulos' macro studies use cost benefit analysis (CBA) while this study and that done by Bennel use Mincerian earnings function. A Mincerian earnings function only has opportunity cost as the only cost while CBA includes all costs of education *e.g.* tuition, money for purchase of books and materials. Any comparison should therefore be made with a lot of caution.

[4] The square of experience, Exp² is to take care of the concavity of the earnings function and its coefficient is expected to be negative. This implies that earnings will rise because of experience but at a diminishing rate.

issue raised by Halvorsen and Palmquist (1980)[5] (Siphambe, 2000). As is common practice, there is a correction of sample selection bias, which is done easily using the Heckman two step models in STATA software. This involves a two step process in which we specify a probit regression equation in which a series of personal characteristics serve as regressors. These are age, education and marital status. From this probit equation which is done automatically by using the heckman command in STATA, a selection variable, the Inverse Mills Ratio is created and inserted into the right hand side of the earnings function. The equation is then automatically re-estimated for those employed to yield estimates free of censoring bias.

3. THE DATA

The data used is from 2002/2003 HIES conducted by Central Statistics Office. The sample frame for the HIES survey consisted of 4,114 Enumeration Areas with a sample size of 6,053 households translated into an estimated coverage of 25,069 persons. The survey estimated that there were 394,272 household in the country with 1,632,922 persons in 2002/2003. Just like the 1993/1994 HIES, the sample was selected in a manner that made it quite representative of the population of Botswana. To be able to make a labour market analysis, we defined the labour force as only those aged between 14 to 65 in line with international practice and therefore dropped those below the age of 14 and those above 65.[6] Fifty-five per cent of the sample is male, which is generally consistent with the nature of Botswana's labour market.

4. EARNINGS DIFFERENTIALS

This section looks at some of the major characteristics of the sample in terms of their education, earnings, age, *etc*. The average age of males and females is almost equal at 40 years of age. The average level of education is also almost equal between men and women at 6.8 for men compared with 6.9 years of education for women. Despite the almost equal average education, earnings are still higher for men for all levels of education compared with women. Table 1 shows average earnings of workers in the sample by levels of

Table 1. Mean monthly gross earnings of workers by education levels (Pula): overall and by gender

School category	Overall	Male	Female
No School	848	945	723
Lower Primary (1-4)	1,310	1,602	1,051
High Primary (5-7)	1,878	2,348	1,403
Low secondary (8-10)	2,140	2,550	1,751
High Secondary (11-12)	4,126	4,860	2,837
Tertiary education (13 plus)	8,585	10,431	6,054
All	2,896	3,504	2,163

Source: Household Income and Expenditure Survey data, 2002/2003.

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[5] They point out that the value of the coefficient of a dummy variable in semilogarithm regression equation is not a good estimate of the effect of that variable on the variable being explained for large values of the coefficient.

[6] Botswana defines labour force as people aged 12 years and above who were either employed or looking for work during the survey period.

education. As expected, average earnings increase as the level of education rises. Males with post-secondary education earn eleven times more than those with no formal education. This ratio has increased compared with the results from the 1993/1994 HIES data, which was six times as reported in Siphambe (2000). The earnings differentials for females, however, decreased from those with post-secondary education earning thirteen times more than those with no formal education to them earning eight times more. Compared with earnings differentials reported in 1972, 1986 and 1993/1994 (4.5, 6.1 and 7.2, respectively), these ratios indicate an increase in earnings differentials between those with lower levels of education and those with higher levels of education.[7] The results reflect the liberalised current labour market since the implementation of the 1990 Revised Incomes Policy, which allowed wages in the private sector to generally be determined by the market forces (Republic of Botswana, 1991). The private sector is also much bigger in size accounting for about 50% of the share of employment in Botswana than in the previous period when it accounted for about 40% of employment (CSO, 1999).

Females on average earn less than their male counterparts for all education levels, but the inequality between genders becomes progressively more as education rises. The ratios rise from 1.3 between those with no schooling to 1.7 between those with tertiary education. This is in contrast to 1993/1994, where inequality between gender was progressively less as education rose. At a general level, the gender wage gap has increased from a ratio of 1.2 in 1993/1994 to 1.6 in 2002/2003. That gap is more pronounced at higher levels of education than at lower levels. This may be consistent with the increase of the share of the private sector in the economy over time. Siphambe and Bakwena (2001) show that a major explanation for the wage gap in the private sector is due to discrimination, while that was not the case for the public sector. As the country strives to privatise some of the government activities, this issue of the wage gap together with income inequality concerns should be taken on board.

5. EXPLORING EARNINGS VARIATION

In this section we report results of earnings functions in order to explain the differences in earnings in the sample by means of differences in the human capital characteristics of individuals. The dependent variable is natural log of earnings, where earnings are defined as cash earnings plus wages in kind. These are the earnings reported for the month proceeding the survey period. The independent variables are schooling, experience and experience squared. Experience is approximated as age − years of schooling − 7 for those with education higher than 7 years of schooling, and Age − 14 for those with education of 7 or fewer years. The Age − 14 is a correction aimed at avoiding overestimating potential experience for those with fewer years of education.[8]

Table 2 summarises the basic earnings function using HIES 2002/2003 data with continuous education variable. All the coefficients are significant at 1% level and have the right signs. The model explains 29% of the variations in earnings. The explanatory power of the model is quite robust and is quite comparable if not slightly better than some of the results that have used this basic earnings function on developing countries; for instance

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[7] See Kann *et al.* (1988: 104) for summary of the ratios for 1972 and 1986 and Siphambe (2000) for the 1993/1994 figures.

[8] See Dougherty and Jimenez (1991) for further discussion on this correction.

Table 2. Mincerian earnings function: overall Ψ

Dependent variable (ln monthly earnings)

Variable	Coefficient
Constant	4.08 (321.6)
Education	0.15 (378)**
Experience	0.085 (171.2)**
Experience Squared	−0.001 (−142)**
IM Ratio	−2.12 (3.68)**
R^2 (Adjusted)	0.29
Sample Size (n)	5,328

Ψ *Note:* t-statistics in parenthesis.

** Significant at 1% level of significance.

Table 3. Mincerian earnings function by gender Ψ

Dependent variable (ln monthly earnings)

Variable	Male	Female
Constant	2.49 (10.54)	3.03 (11.52)
Education	0.154 (33.35)**	0.152 (25.2)**
Experience	0.166 (14.08)**	0.119 (9.4)**
Experience Squared	−0.001 (−11.0)**	−0.001 (−6.7)**
I M Ratio	−8.30 (11.6)**	−15.1 (14.5)**
R^2 (Adjusted)	0.34	0.23
Sample Size (n)	2,971	2,357

Ψ *Note:* t-statistics in parenthesis.

** Significant at 1% level of significance.

Kugler and Psacharopoulos (1989), Psacharopoulos and Steire (1988), Al-Qudsi (1989), Psacharopoulos *et al.* (1994). It is, however, weaker than that obtained from the results of the 1993/1994 HIES data reported in Siphambe (2000) which was at 38%. This is, however, still acceptable for cross sectional data. The education coefficient, which is also the average rate of return to education, is 15%. Compared with the 1993/1994 average rate of return of 16%, this represents a one percentage point decline between the two periods. This conforms to the expected results that over time the average rates of return to education will in general tend to decline because of changes in the labour market that tend to devalue education, especially at the lower levels. But at a general level, the one percentage point decline between the two periods support the Psacharapoulos hypothesis that the pattern of rates of return remains stable as countries develop with only relatively minor declines. Experience adds positively to earnings until 42.5 years on the job beyond which it contributes negatively to earnings.[9] The selectivity term, Inverse Mills Ratio is negative and significant at 1% confidence level, implying that the observed wage is lower than the wage offers of a randomly selected individual in the population. The second implication is that those who are in full time employment may not necessarily have a comparative advantage.

In Table 3 we fit the Simple Mincerian earnings function with continuous education between male and female workers. The results show that the model has a better explanatory power for males with an R squared of 34% when fitted on data for male workers. All coefficients are significant at 1% level of significance and have the right signs

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[9] The point where experience stops adding positively to earnings is defined by $\frac{\partial LnY}{\partial Exp} = 0$, from the earnings function; $Ln\ Y = a + bS + c\ EXP + d\ EXP^2$. This is equal to $\frac{c}{-2d}$; $d < 0$.

for both sexes. This includes the selectivity term. The rates of return by gender are almost equal at 15.4% for males and 15.2% for females. These results are very different from the ones in Siphambe (2000), where the average rates were higher for females than for males, which was attributed to the lower forgone earnings of females as compared with their male counterparts (see for instance Psacharopoulos and Alam (1991), Gomez-Castillanos and Psacharopoulos (1990), Psacharopoulos *et al.* (1994), Kugler and Psacharopoulos (1989)). This suggests that this may no longer be the case from this data as average rates have almost equalised.

6. PRIVATE RATES OF RETURN TO EDUCATION

Table 4 summarises the results of a Mincerian earnings function that has education as a non-continuous variable. We now have 1-0 dummies for the five schooling cycles[10] presented in column 3 of Table 4. Column 2 presents results from the 1993/1994 data. From the 2002/2003 data, all coefficients are significant at 1% level and have the right signs. All coefficients, except standards 1, 2 and 5 are significant at 5% level and have the right signs. Standard one is not only insignificant but also has a wrong sign. The proxy of experience and its square are also significant at 1% level.

Table 5 is a summary of the private rates of return to the different schooling cycles, which are derived from Table 4. The pattern of rates of return is still the same as that obtained from the 1993/1994 HIES data in Siphambe (2000). Generally rates rise by level of education. This is with the exception of upper secondary that recorded the lowest rate of 8%, which is even lower than primary education by one percentage point.

Table 4. Earnings function with schooling cycles dummies Ψ

Dependent variable (ln monthly earnings)

Variable	All-1993[12]	All-2003
Constant	4.35 (51.6)	3.09 (17.8)
Standard 1	0.24 (1.2)	−0.08 (−0.5)
Standard2	0.14 (0.7)	0.043 (0.38)
Standard 3	0.36 (3.1)**	0.19 (1.79)
Standard 4	0.27 (2.1)*	0.439 (4.5)**
Standard 5	0.25 (1.17)	0.296 (3.15)**
Standard 6	0.39 (3.1)**	0.56 (5.64)**
Standard 7	0.44 (5.8)**	0.6 (7.76)**
Form 1	0.69 (4.5)**	0.65 (12.29)**
Form 2	0.79 (7.7)**	0.72 (3.89)**
Form 3	1.13 (13.8)**	1.02 (16.73)
Form 4	1.16 (2.5)*	1.32 (22.39)**
Form 5	1.74 (16.5)**	1.18 (8.92)**
University	2.17 (11.2)**	2.05 (22.51)**
Experience	0.012 (1.98)*	0.14 (16.22)**
Experience Square	−0.00051 (−4.9)**	−0.0013 (−12.61)**
Inverse Mills Ratio	−1.7 (−17.1)**	−16.5 (11.6)**
R^2 (adjusted)	0.53	0.31
Sample Size (n)	2,891	5,328

Ψ *Note:* t-statistics in parenthesis.

** Significant at 5% level of significance.

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[10] Primary education takes 7 years, lower secondary, 3 years, upper secondary 2 years and university 4 years except for a Degree in Law.

[12] Estimates from Siphambe (1997: 151) using 1993 data.

Table 5. Annual Private Rate of Return to Schooling for each Schooling Cycle with Dummies (%)

Education Level	Primary	Lower Secondary	Upper Secondary	Tertiary
Rate of Return-1993/1994 data	7	26	36	11
Rate of Return-2002/2003 data	9	15	8	24

Source: Based on Table 4.

Ignoring upper secondary education, the general pattern is unlike the conventional Psacharopoulos pattern where rates decline as education increases. The rates are now highest for University education at 24%, followed by lower secondary with 15%. Senior Secondary and primary education have the lowest rates of 8% and at 9%, respectively. The general pattern is also very similar to those obtained by Keswell and Poswell for South Africa. They found that the marginal rate of return is extremely high for tertiary levels and very small for lower levels of education (Keswell and Poswell, 2004).

From our data set, 2003 and 1993, the profitability of primary education rose marginally by two percentage points between the two periods. Both lower secondary and upper secondary became less profitable with their rates falling from 26% to 15% for lower secondary and from 36% per annum to 8% per annum for upper secondary education. On the other hand, the rates of return to tertiary education rose from 11% in 1993/1994 to 24% in 2002/2003. This is not surprising given the dynamic changes in Botswana's labour market. Given the heavy investment in education by Government over the past 35 years, which was taking the lion's share of both recurrent and development budgets, there has been an increase in the supply of educated labour, especially with secondary and tertiary education levels. On the other hand, the absorptive capacity of the economy in terms of creating the required employment was lagging behind. The leading growth sector, mining is capital intensive and employs a small share of the labour force at about 5% (Siphambe, 2003). As a result of the mismatch, unemployment has been rising over the years, and the limited jobs were therefore being rationed through escalation of education qualifications. Lower level education qualifications were therefore getting devalued in the labour market over time and thus the declining nature of the profitability of secondary education in general over the 10-year period. As has been shown in Siphambe (1999), there is also some screening role of education in Botswana, especially in the private sector, which has tended to motivate Batswana[11] to acquire more certificates to be able to increase their earnings.

7. SUMMARY OF RESULTS AND POLICY IMPLICATIONS

Even though Botswana has been a unique developing country for some decades in terms of growth, the results from this paper show that it shares a lot of the typical characteristics of developing countries. The country has in particular, a typical less developed country labour market, characterised by high and rising unemployment levels. These changing dynamics of the labour market have major impacts on education policy and education profitability in terms of different levels. This paper uses the most recent HIES for 2003/2004 to test the pattern of rates of return to the different levels of education and compares the results with those obtained from data from the last HIES data, 1993/1994

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[11] A single citizen of Botswana is a Motswana and the plural is Batswana.

reported in Siphambe (1997) and Siphambe (2000). They are highest for tertiary education, and lowest for upper secondary and primary education levels. The general trend, based mainly on Latin American countries and the aggregate ones reported by Psacharopoulos, is for the rates of return to be highest for primary education followed by secondary education and then lowest for tertiary education. Our results also show that the rates of return to the two secondary school education cycles are quite distinct. Higher secondary education has lower private rates of return than lower secondary. These results are very similar to the ones obtained in Siphambe (2000), in terms of pattern, except the behavior of upper secondary and the declining nature of the rates compared with the last period. Between 1993/1994 and 2002/2003 rates of return to secondary education declined, while the rate of return to tertiary education increased. The rising pattern of private rates of return to education by level of education suggests that there exist some room for private financing at university level and upper secondary education levels. A shift of part of the cost burden from the state to the individual and their family is not likely to create a disincentive of investing in upper secondary and higher education given the high private rates of return to education for these levels of education.

The rates of return to education figures from this study, particularly for primary education, are still quite low compared with those estimated by USAID (1984). The study showed that the most profitable level of education from for the individual was primary education with 528% followed by secondary education with 80%. The least profitable was tertiary education with 38%. The authors, however, acknowledged that there were some fundamental reporting errors for primary education estimates. Moreover, Bennel (1996) rated the quality of data for this study as being among the very poor category. Despite the data problems of the USAID (1984) study, the results of the 1993/1994 and 2002/2003 data indicate evidently that private rates of return to education have been declining especially for lower secondary and primary education cycles. The falling rates are quite expected given the dramatically changing labour market conditions, particularly on the supply side. There was a significant increase in the supply of graduates (as proxied by total student enrolment) to the labour market, while job opportunities rose less fast. Employment has been increasing at an average of 1.5% per annum while the labour force was increasing at about 2.5% per annum (MFDP, 2005). In other words, the rate of employment creation was not adequate to absorb all the graduates entering the labour market. The latest figure on unemployment is estimated at 17.5% and is highest for those aged less than 25 years of age or the youth in general (CSO and LFS, 2006). It is also highest for those with 1-3 years of secondary education, followed by those with primary education and those with senior secondary (CSO, 2004; HIES, 2002/2003). Graduate unemployment is also beginning to rise and is estimated at about 1.5% of the total unemployment (CSO, 2004).

As educational qualifications continue to be devalued in the labour market, there is likely to be (as is already evident) increased pressure for more places at the upper secondary and tertiary education levels. This therefore means that employment creation has to be pursued more vigorously. Botswana has continued to struggle with economic diversification, and even after so many efforts in terms of policies and programmes, the country is still dominated by the mineral sector, especially diamond. Efforts need to be doubled to promote the non-mineral sector, as the mining sector is capital intensive and contributes only 5% to total formal employment in the country. Siphambe (2003),

BIDPA (2005) have shown that there is a great potential from the tourism industry to contribute to employment and growth if properly developed.

The result of this mismatch between supply and demand for labour was that competition for the few jobs became intense. The competition was further pushing for more demand for education at all levels, as obtaining better education qualifications than fellow job seekers became the principal means for securing employment. The labour market was also responding to these increases in supply of graduates by escalating minimum job requirements. The result was that school leavers were filtering down occupation hierarchies. For instance, jobs that were previously the preserve of illiterates and primary school graduates are now being competed for by secondary school graduates as they filter down the occupation hierarchies and those previously taken up by secondary school graduates are now being competed for by tertiary education graduates.

Although rates of return are generally low, primary and upper secondary education are the most affected. For primary education, the rates are low because the earnings differentials between workers with primary education and those with no education are very small. Therefore, monetary benefits of going to primary school are very small. This is a result of a phenomenon we have already discussed that, the primary school graduates were being bumped out of the labour market to very lowly paying jobs including the informal activities. There are of course some major non-monetary benefits to primary education, which this model does not capture; for instance political awareness, health, *etc*. Moreover, the benefits for primary education are captured as benefits to other levels of education for those who go beyond primary education (see Siphambe (2000) for a thorough discussion of this comment). For upper secondary, this may be a reflection of the tightening labour market that has seen them being displaced in most jobs by those with tertiary education. Those in employment were not earning much more than the lower secondary school graduates. What could have happened is a further bumping up process as a result of scarcity of jobs, as senior secondary graduates were being replaced by university graduates in most jobs. If the trend of unemployment and changes in the labour market continue as they are, we would expect rates of return to tertiary education to continue to rise, while that of secondary education declines generally.

Ignoring upper secondary, generally rates of return to education increase by level of education. Apart from the changes in the labour market that we have already discussed, these results may have other major implications about education. First, that more able people obtain more schooling. The higher rates for higher levels will therefore be a result of higher ability. Second, that quality of education may be improving as one moves up the education ladder. However, our study does not measure changes in school quality and ability differences. We therefore cannot be more concrete about the changes in ability and school quality. A more important issue emanating from these results, which is mentioned in Siphambe (2000), is that the British-type of schooling usually contains a strong filtering and screening mechanism through which more able students, or students from household in the higher end of the income distribution, transit up the educational hierarchy. Guisinger *et al.* (1984) makes a similar point about the positive relationship between rates of return and level of education for Pakistan. Part of the reason is also due to the screening role of education in Botswana as documented in Siphambe (1999).

Finally, education in Botswana appears to exacerbate income inequalities. The high rate of return for higher levels of education indicate that the distance between the earnings of the highest and lowest worker in the skill hierarchy is big, which may be one

reason why Botswana has such a high and increasing income inequality, which is working negatively to the growth being pro-poor or being able to effectively reduce poverty. Between 1993 and 2003 the gini-coeffecient for disposable income rose slightly from 0.537 to 0.573 (CSO, 2004).

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