THE IMPACT OF ECONOMIC GROWTH ON THE MATRIC PASS RATE IN SOUTH AFRICA

By

Khutso Thobakgale 211144991

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SUPERVISOR: PROF. RONNEY NCWADI

STUDENT DECLARATION

FULL NAME: Khutso Oupa Thobakgale

STUDENT NUMBER: 211144991

In accordance with rule G4.6.3, I hereby declare that the above-mentioned treatise is my own work, that all the sources used or quoted have been identified and acknowledged using complete references and that it has not been submitted to another university for any qualification

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EXECUTIVE SUMMARY

The study provides an econometric analysis of the impact of economic growth on the matric pass rate in South Africa. The model used provincial pass rates from the year 2008 to 2013 as well as the economic growth rates of each province from the same period. A panel data random effects model was used to run the model and produce the results. An extensive literature review was conducted to analyse the pass rate in the Eastern Cape which has been the lowest in South Africa for some years.

The results of the model suggest that economic growth in the different provinces has a positive effect on the matric pass rate except for the Eastern Cape, Limpopo and Mpumalanga. The model also produced a low R^2 indicating that economic growth does not sufficiently explain the matric pass rate in the different provinces and other factors which were not included in the model are important.

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Chapter 1

1.1 Introduction

South Africa has an unemployment problem. In the last few years, the unemployment rate has been around the 24 to 25 percent range (Trading Economics, 2016). The lack of skills of the labour force is a major contributor to unemployment in the country. According to Kirk (2010), poor education levels and a mismatch of unskilled labour and poor skills contribute to unemployment.

The South African economy needs an injection of skilled workers to accommodate the needs of the tertiary sector. Kirk (2010), argues that the tertiary sector in South Africa grows at a faster rate than the primary sector. The labour market cannot be trained fast enough to meet growing tertiary sector demand (Kirk, 2010).

The Government has an obligation to address the skills shortage faced by the tertiary sector. Significant investment in human capital, as well as a creation of jobs, is needed to improve economic growth.

Poverty remains an issue of post-apartheid South Africa. According to the General Household Survey, more than 40 percent of the population was poor in 2011 (Statistics South Africa, 2011). Improving access to higher education can equip individuals with the necessary skills to participate in the economy and reduce poverty.

South Africa seems to have a dependency problem. Statistics South Africa (2014), reports that the number of grants disbursed by the government has increased since the year 2000. One way to solve the dependency on the state is to improve the level of education of the workforce. A well-educated workforce can earn higher salaries and support themselves as well as their families and relieve the burden of the state to provide for them.

Increased tertiary education participation should be top of the government's agenda. Encouraging high enrolment rates in universities is important but insufficient. The next step should see government promote high pass rates for university students, either in the form of increased financial assistance or incentives for students that graduate in record time. The biggest incentive of all would be more job opportunities that can help ensure that graduates find work quickly after they finish their studies.

This study focuses on the impact that the economic growth rate has on the matric pass rate in each province. Improving the matric pass rate is an important objective for the government of ensuring that more learners can have the opportunity to pursue higher education and increase their employability.

1.2 Objectives of the study

The main objective of this study is to measure the impact that the economic growth on the matric pass rate

The sub-objectives are the following:

- To determine the effect of the economic growth of each province about the pass rate.
- To determine whether economic growth is the major contributor to learner performance of if there are other factors.
- To give recommendations based on the findings of this study.

1.3 Problem statement

There is a significant difference in the matric pass rate between provinces in South Africa. For example, in 2015 the Eastern Cape had the lowest pass rate at 56.8 percent compared to the highest performing province which was the Western Cape at 84.7 percent (Statistics South Africa, 2016). There has been little improvement in the pass rate of the Eastern Cape over the last few years. In 2011 the pass rate was at 58.1 percent.

South Africa's matric pass rate has also been suffering a lack of growth over the years. For example, South Africa's matric pass rate declined from 73.2 percent in 2003 to around 60.6 percent in 2009 (Faulkner, Lowald and Makrelou, 2013). In 2013 the national pass rate was at 78.2 percent compared to 70.7 percent in 2015 (Statistics South Africa, 2016)

The lack of improvement in the pass rate of Grade 12 learners in South Africa is a worry since there is a need for skills in the labour market. According to Faulkner, Lowald and Makrelou (2013) around 20 percent of matric graduates in South Africa proceed to higher education which is very low.

Poverty is an important issue that South Africa can address by improving the number of graduates in the labour force. According to Statistics South Africa (2015), almost half of South Africa's population lives below the poverty line.

According to the World Bank (2015), the international poverty line is below 1.90 dollars. Reducing poverty can prove challenging especially if the population in that country is not well educated. Improving thew quality of education rates is the first step the next step is ensuring a larger more skilled workforce.

This study aims to determine the impact of economic growth in each of the provinces to assess whether the lack of growth is the major cause of the stagnating pass rates. The outcome of this study can help policy makers get a better understanding of the link between the economic performance of a province and its effects on the educational success of that province.

1.4 Significance of the Study

This study aims to explore an avenue that can lead to a potential solution to improving matric pass rates in South Africa. The study analyses and the pass rates of the different provinces to identify whether the differences in growth between provinces can be used to explain the large differences in pass rates

Many more studies can be conducted at a macroeconomic level to try and find solutions for improving the quality of education in the different provinces.

1.5 Research Methodology

This study uses quantitative methodology and data used in this study will be obtained using secondary sources. The secondary sources used in this study include government publications, research reports, academic journals, the internet and other related studies.

A regression analysis will be carried out to determine the impact that the economic growth of each of the provinces has on the provincial matric pass rate. The explanatory variable in the model will be the growth rate of the different provinces, and a panel random-effects model will be used to analyse the data. A review of previous literature will be included to form the theoretical background of the model.

Various other analytical methods such as graphs and previous literature will be used in this study. The data used in this study will be collected from Statistics South Africa as well as the ECSECC.

1.6 Limitations of the study

The study was conducted by measuring the effects that the economic growth in each province has in their pass rates. The model used in the study only contains one dependent variable, and

it leaves out all the other factors that could potentially affect the pass rates of the provinces. The model was conducted using macroeconomic data and does not conduct surveys or interviews to better understand the causes of the differing pass rates among provinces.

There are many possible factors that can explain matric pass rates in South Africa. Factors such as the quality of education, the number of teachers available as well as the infrastructure to name few could also have an impact on how well students do at school. A study done at a microeconomic level may be more suitable for identifying and analysing these factors.

1.7 Conclusion

South Africa's education needs improvement and not just at the institutional level, but the economy as a whole has to expand to accommodate better the number of potential graduates entering the labour market. The biggest incentive provided by education is the ability to earn a much higher salary over long periods. A slow growing economy does little to motivate students to finish their studies. The government has to find a way to encourage faster growth rate to grow the economy and provide more employment opportunities for students entering the labour market.

Chapter two of this study will discuss theoretical literature on growth models and human capital theory. A review of similar studies done on the factors that affect the matric pass rate will also be included as well as an analysis of the pass rate of the Eastern Cape. Chapter three will provide empirical and theoretical analysis on the model used to measure the impact of economic growth on the matric pass rate. Chapter four will present the results as well as the analysis of the findings from the model.Chapter five will include the recommendations and conclusion from the model.

Chapter 2

Literature review

2.1 Introduction

Jareb (2006) describes the role of educational institutions as to be of service to society through laying the basis for sustainable employment, preparation for citizenship, personal development and advancement of the knowledge base. The description given by Jared (2006) signifies the importance that education has on the society and not just on the individual. This explains why individuals and governments spend a large amount of money on education.

This chapter provides a discussion of growth theories as well as human capital theory. The human capital theory is one of the most important theories in explaining why individuals choose to invest in education. A review of recent studies related to economic growth and education is also provided in this chapter.

2.2 Theoretical literature

2.2.1 Growth models

2.2.1.1 The Harrod-Domar Growth Model

The Harrod-Domar model can be explained by considering an economy that produces one homogeneous good Y. Good Y may be used as either an investment good I or as a consumption good C. Households are assumed to consume and save whereas firms produce and invest. All variable and the money market is absent

The GDP which equals the national income at time t is then given by $Y_t = C_t + I_t$. Consumption and savings are linear homogeneous functions of national income, with Cm as the marginal propensity to consume and Sm the marginal propensity to save (Sm=1-Cm). $C_t = CmY_t$, $0 < Cm < 1$ and $S_t = SmY_t$. The constant values of Cm and Sm imply that marginal values equal average values. Also, an equilibrium condition is imposed assuming that investment equals savings in every period.

Another condition asserts that firms intend to realise a certain capital-output ratio $v^d = K_t^d / Y$. the capital-output ratio v^d reflects the notion that capital is fully employed if the desired rate is realised and again brings about the equivalence of marginal and average variables.

If v^d is constant, capital must grow at the same rate as GDP. This is assured by investments of firms which take the expected change in national income $\dot{Y}_t^e$ as a reference, giving $I_t = k_t = v^d\dot{Y}_t^e$, where the dot over the variable gives the derivative wit respect to time. Integration yields $k_t = v^d \dot{Y}_t^e$ or $k_t^d = v^d\dot{Y}_t$, expressing the fact that only the correct anticipation of guarantees the correspondence of realised with desired quantities.

To derive the growth rate for the economy, $\dot{Y}_t = k_t/v = SmY_t/v$ holds because $I_t = SmY_t$ which gives $\dot{Y}_t/Y_t = Sm/v$. The growth rate of the capital stock is derived from $\acute{k}_t = SmY_t$ and $k_t = vmY_t$ as $\acute{k}_t/k_t = Sm/v$. Because $I_t = SmY_t$ and $C_t = CmY_t$ if follows that $\dot{I}_t/I_t = \dot{C}_t/C_t = \dot{Y}_t/Y_t = Sm/v$. these considerations show that there exists a growth path on which GDP, consumption, the capital stock and investment grow at the same rate which is called the warranted rate of growth.

All variables have to grow at the same rate meaning that if the investment is constant for all years, the level of aggregate demand will also remain constant according to the Keynesian multiplier theory.

2.2.1.2 The Solow Growth Model

Joines (1999) explains the Solow model by using the aggregate production function which, relates the total output of a country to the country's aggregate inputs of the factors of production.

The model can be written as:

$$Y_i = (AiL_t)^{\alpha}\, k_{t-1}^{1-\alpha} \qquad (2.2.2)$$

Output depends on the aggregate labour input L_t, the aggregate capital inputs k_{t-1} and a productivity parameter A_t. Joines (1999) explains that other factors like land or environmental quality could also be included in the model as well as subdivide versions of certain factors such as labour of different quality.

The production function of equation 2.2.2 exhibits constant returns to scale, which means that when the inputs are doubled, output also doubles (Joines, 1999).

Equation 1 indicates the potential source of economic growth in output Y_t. Either the inputs L_t and k_{t-1} must grow, or productivity A_t must grow. Growth in productivity, and productivity is assumed to be exogenous and constant. Instead of modeling the savings decisions explicitly, we assume that consumers invest a fixed fraction of output every period.

In the Solow model, the law of motion for capital can be expalined as:

$K_t = (1-\delta)\, k_{t-1} + I_t$ (2.2.3)

Where I_t is the investment and δ is the depreciation rate, which is between zero and one, we assume that investment is a fixed function $0 < s < 1$ of output:

$I_t = sY_t = s\,(A_tL_t)^{\alpha}\, k_{t-1}^{1-\propto}$ (2.2.4)

Productivity and labour grow at fixed rates μ and γ:

$A_t+1 = (1+\mu)A_t$, and: (2.2.5)

$L_t+1 = (1+\gamma)L_t$ (2.2.6)

According to Joines (1999), to find out how an economy develops starting from any initial level of capital Ko, we assume that there is a competitive firm operating the production technology. If we want to check whether the model is in line with the stylised facts of economic growth in industrialised countries (constant labour and capital share), we have to solve the firm's maximisation problem (Joines, 1999).

The firm's profit maximisation problem is defined as:

$$\max_{L_t;k_{t-1}} \{(A_t\, L_t\,)^{\alpha} k_{t-1}^{1-\alpha} - w_t L_t - r_t k_t - 1\} \quad (2.2.7)$$

The first order condition on labour and capital yields formulas for wage and interest:

$w_t = \alpha A_t^{\alpha}\, L_t^{\alpha-1}\, k_{t-1}^{1-\alpha}$ and: (2.2.8)

$r_t = (1-\alpha)(A_tL_t)^{\alpha}$ (2.2.9)

We can use these to compute the labour and capital shares in the economy:

$\frac{w_t\, L_t}{Y_t} = \frac{\alpha A_t^{\alpha} L_t^{\alpha} k_{t-1}^{1-\alpha} L_t}{(A_tL_t)^{\alpha}} = \alpha$, and: (2.2.10)

$\frac{r_t k_{t-1}}{Y_t} = \frac{(1-\alpha)(A_tL_t)^{\alpha} k_{t-1}^{-\alpha} k_{t-1}}{(A_tL_t)^{\alpha} k_{t-1}^{1-\alpha}} = 1-\alpha$ (2.2.11)

So the labour share is α, and the capital share is 1-α. Both the labour and capital shares are indeed constant. The result is closely connected to the fact that the probability function exhibits constant returns to scale.

Joines explains the dynamics of capital cumulation in the model as follows: the product A_tL_t is referred to as effective labour because in A_t makes labour more productive, for example

A_t=2 and L_t=1 amounts to the same quantity of effective labour, all variables will be constant in the long run.

Variables in terms of effective labour are written as:

$y_t = Y_t/ (A_t L_t)$, $k_{t-1} = k_{t-1}/ (A_t L_t)$, (2.2.12)

and $i_t = I_t/ (A_t L_t)$ substitutes $Y_t = y_t A_t$ and so on into the production function equation yields:

$y_t A_t L_t = (A_t L_t)^{\alpha} (k_{t-1} A_t L_t)^{1-\alpha}$ or (2.2.13)

$y_t = k_{t-1}^{1-\alpha}$ (2.2.14)

From the same equation of motion for capital equation we get the law of motion in terms of effective labour:

$k_t(1+\mu) A_t(1+\gamma) L_t = (1-\delta) k_{t-1} A_t L_t + i_t + A_t L_t$ or: (2.2.15)

$k_t(1+\mu)(1+\gamma) = (1-\delta) k_{t-1} + i_t$ (2.2.16)

Investment is then determined by:

$i_t = sy_t = sk_{t-1}^{1-\alpha}$ (2.2.17)

Entering the equation of investment into the law of motion yields:

$k_t(1+\mu)(1+\gamma) = (1-\delta) k_{t-1} + sk_{t-1}^{1-\alpha}$ or (2.2.18)

$k_t = \frac{(1-\delta) + k_{t-1} + sk_{t-1}^{1-\alpha}}{(1+\mu)(1+\gamma)}$ (2.2.19)

The above equation determines the development of the capital stock over time (Joines, 1999). Dividing by k_{t-1} yields an expression for the growth rate of capital per unit of effective labour:

$\frac{k_t}{k_{t-1}} = \frac{1-\delta+sk_{t-1}^{-\alpha}}{(1+\mu)(1+\gamma)}$ (2.2.20)

The expression $\frac{k_t}{k_{t-1}}$ is called the gross growth rate of capital per unit of effective labour. The gross growth rate equals one plus the net growth rate.

Since the exponent on k_{t-1} in equation (2.2.20) is negative, the growth rate is inversely related to the capital stock. When a county has a lower level of capital per unit of effective labour , its capital and hence its output grows faster. Thus, the model explains the convergence of GDP of countries and regions over time.

Since the growth rate of capital decreases in k_{t-1}, there is some level of k_{t-1} where capital per unit of effective labor stops growin. The economy then reaches a steady state and stays there forever.

At the steady state, we have $k_t = k_{t-1}$. The steady-state level of capital per unit of effective labor which is denoted as K has to satisfy $K(1+\mu)(1+\gamma) = (1-\delta)K + sK^{1-\alpha}$

Which yields:

$$K\left(\frac{s}{\delta+\mu+\gamma+\mu\gamma}\right)^{1/\alpha} \quad (2.2.21)$$

From this equation, the output and growth in the steady-state can be shown. Output per effective labour in the steady state is:

$$\bar{y} = K^{1-\alpha} = \left(\frac{s}{\delta+\mu+\gamma+\mu\gamma}\right)^{\frac{1-\alpha}{\alpha}} \quad (2.2.22)$$

The level of output depends positively on the saving rate.The steady-state investment per unit of effective labour is:

$$\bar{\imath} = s\left(\frac{s}{\delta+\mu+\gamma+\mu\gamma}\right)^{\frac{1-\alpha}{\alpha}} \quad (2.2.23)$$

The steady state growth rate of capital is $\mu+\gamma+\mu\gamma$:

$$\frac{k_t}{k_{t-1}} = \frac{\bar{k}(1+\mu)A_t(1+\gamma)L_t}{\bar{k}A_tL_t} = 1+\mu+\gamma+\mu\gamma \quad (2.2.24)$$

And the growth rate of output equals $\mu+\gamma+\mu\gamma$ as well implying that the long-term growth rate of an economy is independent of the saving rate. With a higher saving, the economy approaches a higher steady-state, but the long-run growth rate is determined by growth in labour and productivity only.

To verify the return for capital is constant:

$$r_t = (1-\alpha)(A_tL_t)^{\alpha}k_{t-1}^{-\alpha} = (1-\alpha)\left(\frac{k_{t-1}}{A_tL_t}\right)^{-\alpha} \quad (2.2.25)$$

In the steady state, capital per unit of effective labour is constantly $\bar{k}$. Therefore the return to capital in steady state is:

$$\bar{r}_t = (1-\alpha)\bar{k} - \alpha \quad (2.2.26)$$

Which is constant since $\bar{k}$ is constant. The wage is growing in the steady-state, since the productivity of labor increases. The steady-state wage can be compute as:

$$w_t = \alpha A_t^{\alpha} L^{\alpha-1} k_{t-1}^{1-\alpha} = \alpha A_t (\frac{k_{t-1}}{A_t L_t})^{1-\alpha} = \alpha A_t \bar{k}^{1-\alpha} \text{ ; so} \quad (2.2.27)$$

$$\frac{w_{t+1}}{w_t} = \frac{A_{t+1}}{A_t} = 1 + \mu \quad (2.2.28)$$

Which implies that the wage grows at the rate of technological progress.

The capital-output ratio in the steady-state is:

$$\frac{k_{t-1}}{Y_t} = \frac{\bar{k} A_t L_t}{\bar{y}_t A_t L_t} = \frac{\bar{k}}{\bar{y}} \quad (2.2.30)$$

Joines (1999) emphasises that the key element of the Solow growth model is the neoclassical constant-returns production function. According to Joines(1999), the returns to capital alone are decreasing causing to economies grow faster at lower levels of capital until they approach a steady-state, where units of effective labour and capital grow at the same rate. The model also explains why different saving rates in different industrialised countries into long-term differences in the growth rate (Joines, 1999).

2.2.2 Human capital theory

According to Acemoglu and Autor (2011), human capital refers to the innate or acquired stock of knowledge or characteristics a worker has that contributes to their overall productivity. Characteristics of the worker refer to school quality, training and attribute towards work.

Acemoglu and Autor (2011) mention the unobserved heterogeneity issue of human capital theory which states that if the worker is paid less than another worker with a similar qualification, that must be because of the difference in skill between the workers that is not measured by the years of schooling.

Some of the exceptions that pay differences are related to skills include:

1. Compensating differentials: these are the hard to observe Almendarez asserts that in the past economic strength was largely dependent on tangible assets such as land factories and equipment. Almendarez (2010) states that although labour is a necessary component, increases in the value of the business came from investment in capital equipment. Thus, investing in human capital is more important than investing in hard tangible assets.

2. Labour market imperfection: Jobs lend to differ regarding their productivity and pay so two workers with the same human capital m: Jobs lend to differ regarding their productivity and pay so two workers with the same human capital may receive different wages. One worker may be matched with the high productivity, high pay one and the other worker with the low productivity, low pay one (Acemoglu and Autor, 2011).
3. Taste-based discrimination: Employer prejudice results in them paying their worker a lower wage because of workers gender or race (Acemoglu and Autor, 2011).

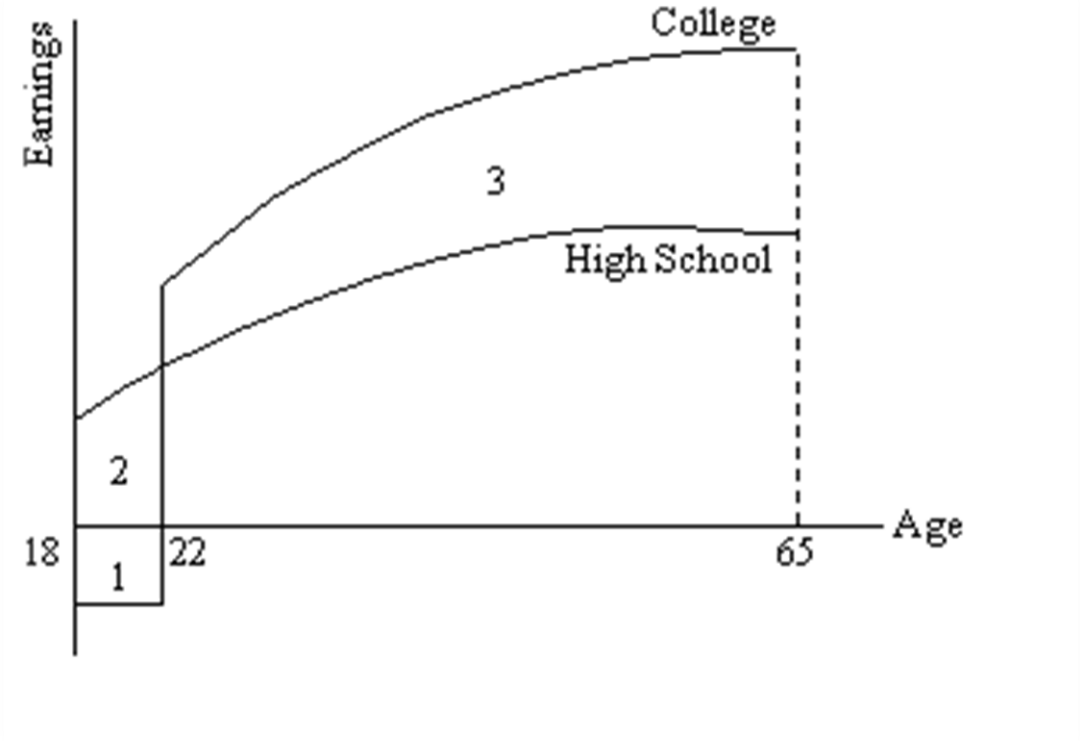
There is a strong correlation between an educated population and technological innovation (Almandarez, 2010). Increasing human capital and on- the-job training fosters economic growth by improving labour productivity, promoting technological innovation and adaptation.

A more scientific approach to analysing human capital is given by Florida (1995(. The cost and benefits of an educational investment are compared and to come to some conclusions (Florides, 1995).

A simple model human capital is the example of a high school graduate trying to determine whether to go to college (Florides, 1995). The graduate faces two types of costs. The direct cost which includes, tuition fees, books and supplies. The indirect costs of attending college are earnings the high school graduate could have earned if he or she had entered the labour market after high school (Florides, 1995). According to Florides (1995), the cost must be compared to the economic benefits of investment in education (the enlarged future flow of earnings).

One important concept is that future benefits are worth less to us than the same benefits received today (Florides, 1995). The reasoning for this is that people prefer current consumption to future consumption and that interest can be earned by investing monetary benefits rather than using them for consumption (Florides, 1995). The net present value (NPV), which florides (1995) defines as the discounted value of a financial sum arising at some future period needs to be calculated. Florides (1995) provides a diagrammatical representation of the cost and benefits below.

Figure 2.1 Potential earnings stream of a high school student compared with a graduate

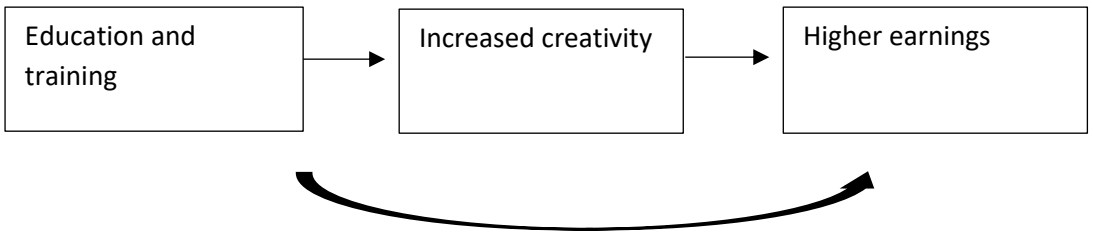


Adapted from: Barker 2007: 207

Direct costs are shown in area numbered one on figure 2.1, indirect costs are shown by the number two and the number three shows the incremental earnings of the college graduate.

According to Barker (2007), the main reason an individual with a higher education qualification earns a high salary is that skills development enhances a person productivity potential.

Figure 2.2 Human capital theory



Private and social rates of return

Private returns refer to the rate that only the benefits and costs to the individual would be taken into account, while the social rate of return takes the costs and benefits of education and training from a societal point of view (Barker, 2007).

According to Barker (2007), the costs to calculate the social rate of return would be all the public subsidies to education, whereas for the individual these costs would be excluded because the individual does not carry these costs (Barker 2007). Barker also states that the after-tax incremental earnings would be calculated for the individual, whereas for the society, as a whole it would be before taxes.

The benefits of investing in education for society included economic growth, reducing unemployment, eliminating poverty, lower crime rate and reducing inequalities (Barker 2007).

According to Poteliene and Tamasauskiene (2013), there are at least three ways of defining the investment in human capital: The private return, the social return and the labour productivity return. The labour productivity return refers to the gross increase in labour, productivity or growth (Poteliene and Tamasauskiene, 2013:p 57-58).

The average net present value of university education can be computed by solving the equation for net present value:

$$\text{NPV} = \sum^{n} \frac{benefits}{(1+r)^{t}} - \sum_{t=0}^{n} \frac{costs}{(1+r)} = \sum_{i=0}^{n} \frac{benefits - costs}{1+r} > 0 \qquad (2.3)$$

Where NPV= The present value of education

Benefits= the benefits associated with higher education

Cost= costs of education

n=number of time periods

r=the interest rate or individual discount rate

The formula indicates that an individual should only invest in higher education if the net present value is above zero. A negative net present value indicates that the investment is not worthwhile to the individual.

Figure 2.3 The human capital model and the related investments or input, and returns on investment or productivity capacity (Zula, Charmanck, 2007).

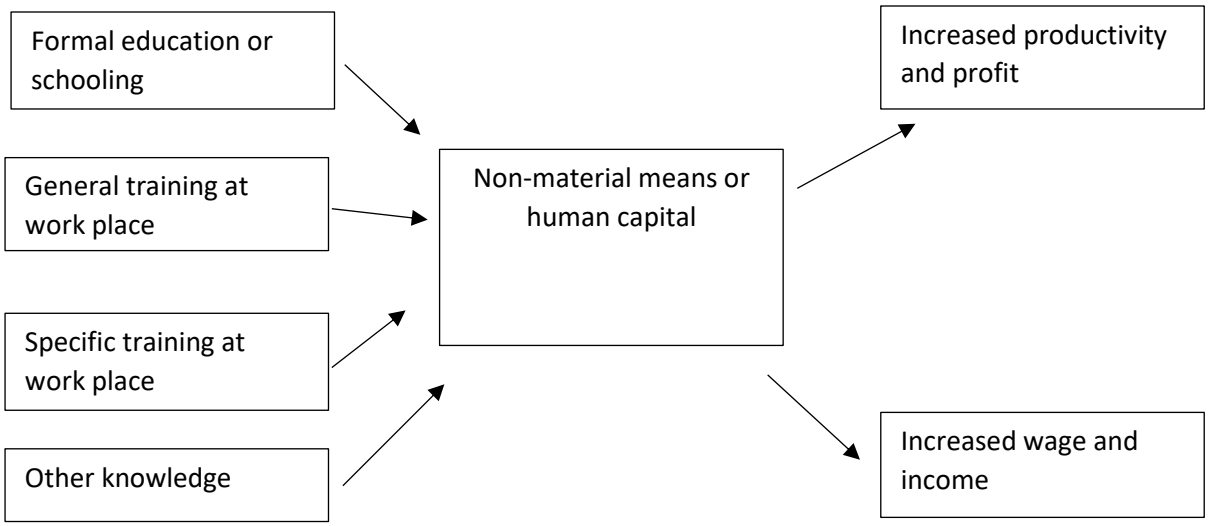


Figure 2.3 clearly illustrates that formal education and training along with general and specific training and other knowledge contribute to human capital which in turn leads to increased productivity and profit which eventually leads to increased wages and income.

2.2.3 Human capital theory and economic growth

About economic growth, Goldin (2014) explains that the growth residual, which is the portion of economic growth that the researcher cannot explain the increase in productive physical factors, was the main reason for economic growth during the twentieth century. The residual can be defined as knowledge uncertain and the augmentation of the labour input through and train (Goldin 2014).

Goldin (2014) adds that the residual has increased over time explaining a substantial fraction of economic growth more than physical capital and land clearing.

According to Goldin (2014), the inclusion of human capital in growth accounting treats increases in education as enhancing the productivity of individuals. Differential productivity is measured by how much higher earning are for workers of different levels of education (Goldin, 2014).

Goldin (2014) explains that the impact of education would be considerably larger if non-private aspects (such as spillover across firms from increases knowledge, lower amounts od criminal activity and greater innovation) of human capital accumulation were included.

Human capital is fundamental to the Galor-Weil model, which shows that a greater and denser population increases population increases in technological change (Goldin 2014:p-5).This technological change complements skill and increases the returns to investments in education which in turn induces technological change (Goldin 2014).

In the aggregate production function, human capital (E) enters by augmenting labour, which is a function of the level of population (P) and the aggregate labour force participation rate,λ, (Goldin 2014:p22). Human capital is measured as an index of efficiency units of labour. Q in the equation stands for the aggregate output, and it is altered by other inputs such as stock of capital (K), resources (X) and the level of technology.

The following equation shows how human capital affects income levels and economic growth:

$$Q=f(A,(E*P\lambda),K,X)) \qquad (2.4)$$

2.3 Empirical literature review

According to Ramirez, Ranis and Steward (1998) households have a propensity to spend their after-tax income on items which contribute directly to human development such as education, food and health. This means that when poverty levels are high, either because of low per capita GDP levels of inequality; many households decrease expenditure on education and health for basic food.

According to a report by Princeton University (1996), increases in income are associated with improvements in education because families can spend more on school material and are likely to send children to school. Princeton University (1996) adds that as families incomes increases they are in a better position to exert political pressure for better schools. Children from wealthier families are also more likely to be brought up in environments that are more conducive to learning.

Low per capita income is thus associated with lower investment in education by households which is bound to have an impact on the quality of education. Birdsall, Ross and Sabot (1995) mention that primary and secondary school enrolment rates are positively associated with higher levels of per capita income. Educational outcomes such as test scores and rates at which children repeat a year's schooling or drop- out are statistically affected by per capita income.

Birdsall et al. (1995) argue that strong growth and development opportunities provide incentives for families to invest in education by sending their children to school. Strong economic growth advances human development which in turn economic growth.

Although growth can have strongly positive effects on development; it is not sufficient for making more rapid advances in human development (Birdasll, et al., 1995). For example, both Angola and Georgia have per capita incomes of $2200, but while Georgia's levels of health and education are almost as high as those in OECD countries, Angola's are among the worst in the world (Birsall et al., 1995).

Birdsall et al. (1995) found that in Malaysia households tend to spend a higher proportion of their income or goods which directly promote better health and education. Economic growth will impact human development, via increased food expedition and education. For example, Birdsall et al. (1995) show that if the distribution of income in Brazil were as equal as that in Malaysia, then school enrollments among poor children would be 40 per cent higher.

High enrollment rates in East Asia represent an investment in families in the human capital of their children. Also, rapid accumulation of human capital both stimulated growth and reduced inequality.

North Korea's enrollment rates were higher than predicted for its income. In Brazil, it was shown that enrollment rates were lower for poor children. The difference between enrollment rates was explained by the differences in human capital by the two countries.

Birdsall et al. (1995) found that growth in North Korea was export orientated and labour-demanding. The employment and wage growth dramatically raised the returns at the margin for the labour of the poor, making it attractive to increase time allocated to work to finance high-return investments including investments in the education of children. The labour demanding growth path became increasingly skill-intensive over time, contributing to high expected rates of return to schooling, hence to strong household demand for education.

Birdsall et al. (1995) also point out that there is likely to be a high investment in schooling in countries with lower inequality. Where inequality is low, the poor are likely to be benefiting from high returns to labour and invest in human capital and thus to save and invest more including in education.

For example, in Britain, pre-school development tests provided a strong indication of a child's later educational success and that this success was largely attributed to family background

Birdsall et al., 1995). Children with educated and wealthy parents who scored poorly in the early tests tended to catch up, whereas children with a lower educated and lower income parent who scored poorly were unlikely to catch up, and were an at-risk group.

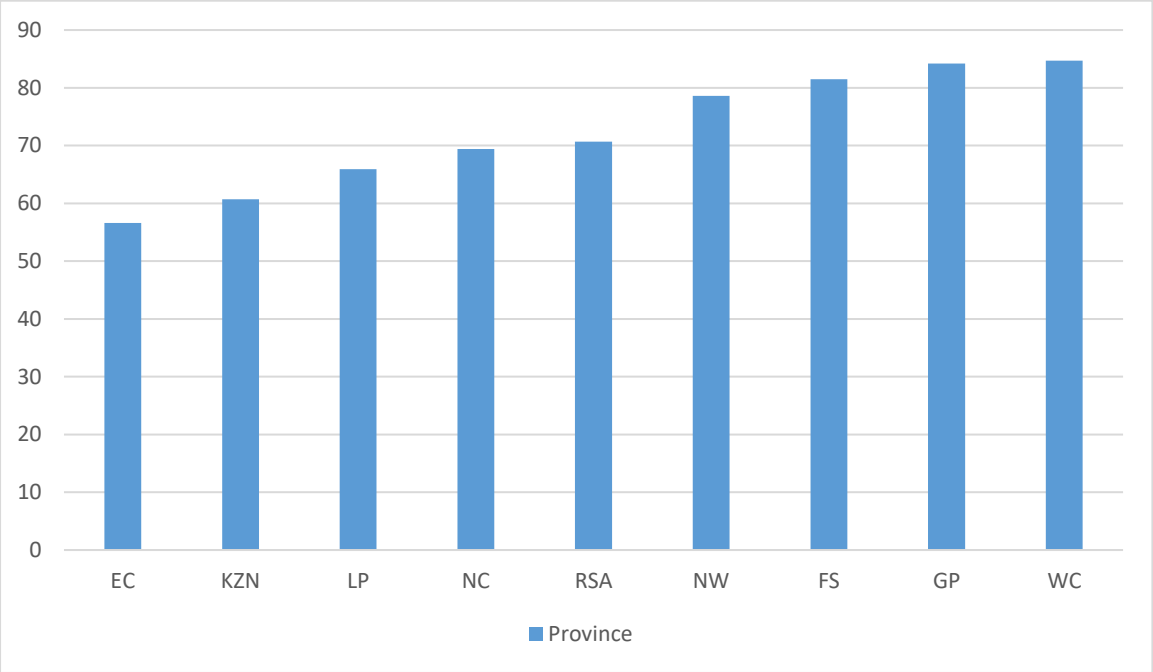
Hanushek and Wöbmann (2007) Evidence also suggests that educational quality is directly related to school attainment. In Brazil, a country plagued by high rates of grade repetition and school dropouts, higher cognitive skills in primary school lead to lower repetition rates. Lower quality schools, measured by lower value added to cognitive achievement, lead to higher dropout rates in Egyptian primary schools.

Hanushek and Wöbmann (2007) found that in Albania, Brazil, Colombia, Egypt, Ghana, Indonesia, Morocco, Peru, the Philippines, South Africa, and Turkey, the share of fully literate students in recent cohorts is less than a third. In Ghana, South Africa, and Brazil, only 5-8% of each cohort is literate (Hanushek and Wöbmann, 2007). Hanushek and Wobmann reported that more than 90% of the population were found to be illiterate because they never enrolled in school. They either dropped out of school at the primary or early secondary levels or because even after completing lower secondary education they were found to be illiterate because they didn't gain much knowledge from their studies. In contrast, 42% of the cohort in Thailand, 55% in Armenia, and 63% in Moldova can be viewed as literate at the end of lower secondary schooling Hanushek and Wöbmann, 2007).

2.4 Analysing the pass rate of the Eastern cape

2.4.1 The pass rate trends

Figure 1.4 The matric pass rate in each province in 2015



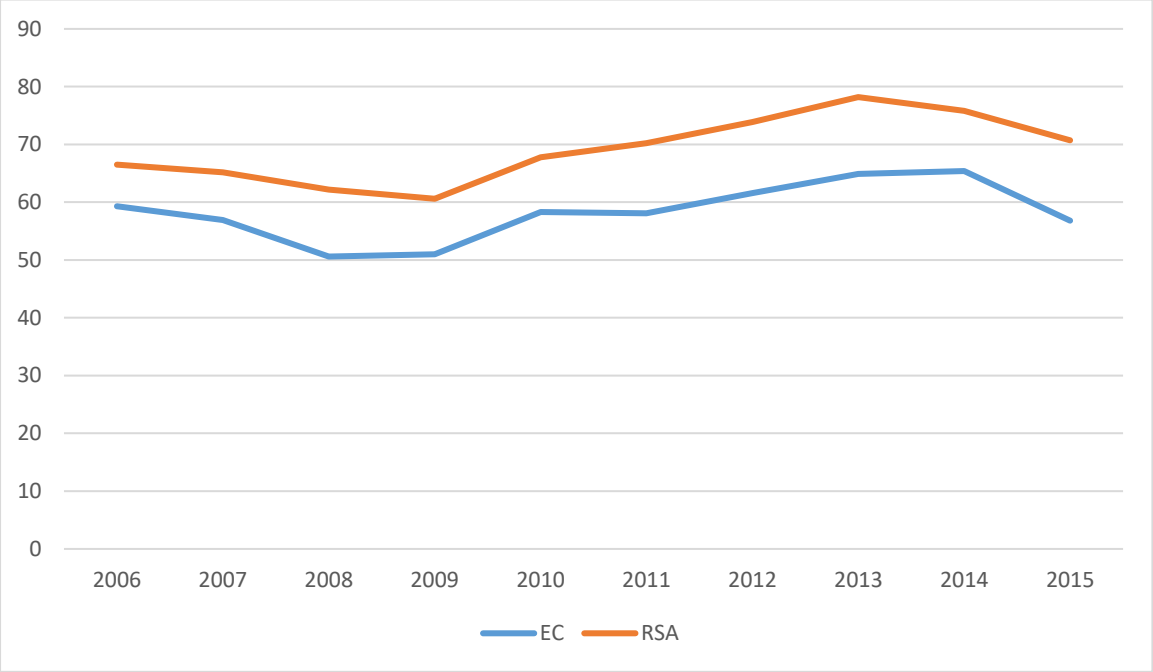
Adapted from ECSECC (2016)

Figure 2.4 indicates that in 2015 the Eastern Cape had the lowest pass rate in South Africa. The pass rate of the Eastern Cape 56,8 percent is much lower than that of the national pass rate of 70,7 percent. A pass rate of 56,8 percent is alarming when considering that 109 052 students enrolled for the national senior certificate and 87 090 of them wrote the exam (ECSECC, 2016).

What is more alarming is that out of the 49 475 students that managed to pass the exam only 15 291 were able to obtain a bachelor pass allowing them entrance to a university. Indicating that more than half of the students that passed don't qualify to study at one of the top universities in the country and gain a high-quality degree.

Comparing the eastern cape pass rate to the national rate from the year 2006 to 2015 shows that the Eastern Cape pass rate has been consistently below the national average. The Eastern Cape has struggled to reach a pass rate of 70 percent over the last nine years.

Figure 2.5 Matric pass rate of the Eastern Cape compared to the national pass rate

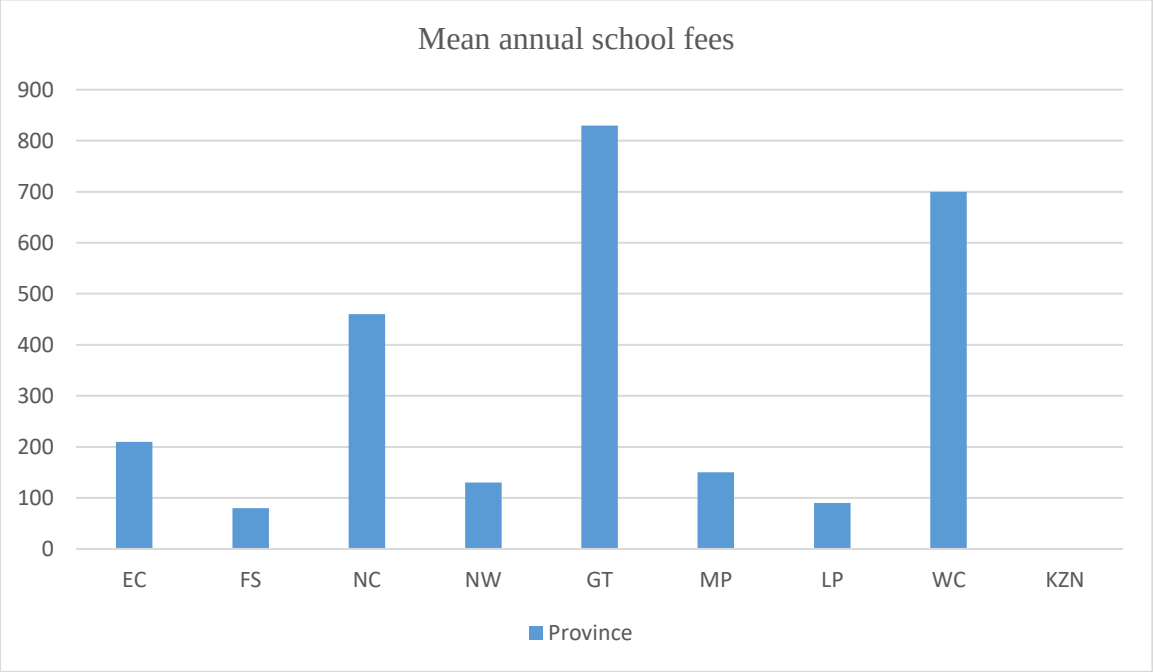


Adapted from ECSECC (2016)

Phurutse (2005) did a study on South African public schools and found that schools that were located in the rural areas had lower pass rates than schools located in urban areas. The housing survey of 2016 done by Statistics South Africa found that there was an increase of formal dwellings from 65 percent in 1996 to 79, 2 percent in 2016. The data also showed that the Eastern Cape had the lowest percentage distribution of formal dwelling at 65,1 percent. The findings suggest that the Eastern Cape has more rural areas than any other province in South Africa. The Easter Cape was also found tp have the highest percentage distribution of traditional dwellings at 26,6 percent.

The low pass rate of the Eastern Cape can partly be explained by the province having more rural areas than the other provinces making the delivery of basic services to schools harder for the government. The household survey data shows that the Eastern Cape had the most households at 24,9 percent that reported to have no access to water

Figure 2.6 Comparing the annual school fees between provinces



Source: Phurutse (2005)

The results show that there are major variations in the mean annual school fees with the Free state charging the least and Gauteng charging the most. The Western Cape and Norther Cape have higher average annual school fees compared with the Eastern Cape, KwaZulu-Natal and Mpumalanga.

Also, the three provinces with the highest annual school fees have an HIV/AIDS prevalence of more than 13 percent with Kwazulu-Natal at 21,72 percent. This interpretation is not to suggest a link between school fees and HIV/AIDS status but rather to indicate that a serious educational challenge exists if those with a higher incidence of HIV/AIDS have poor financial resources learners in such schools are doubly disadvantaged.

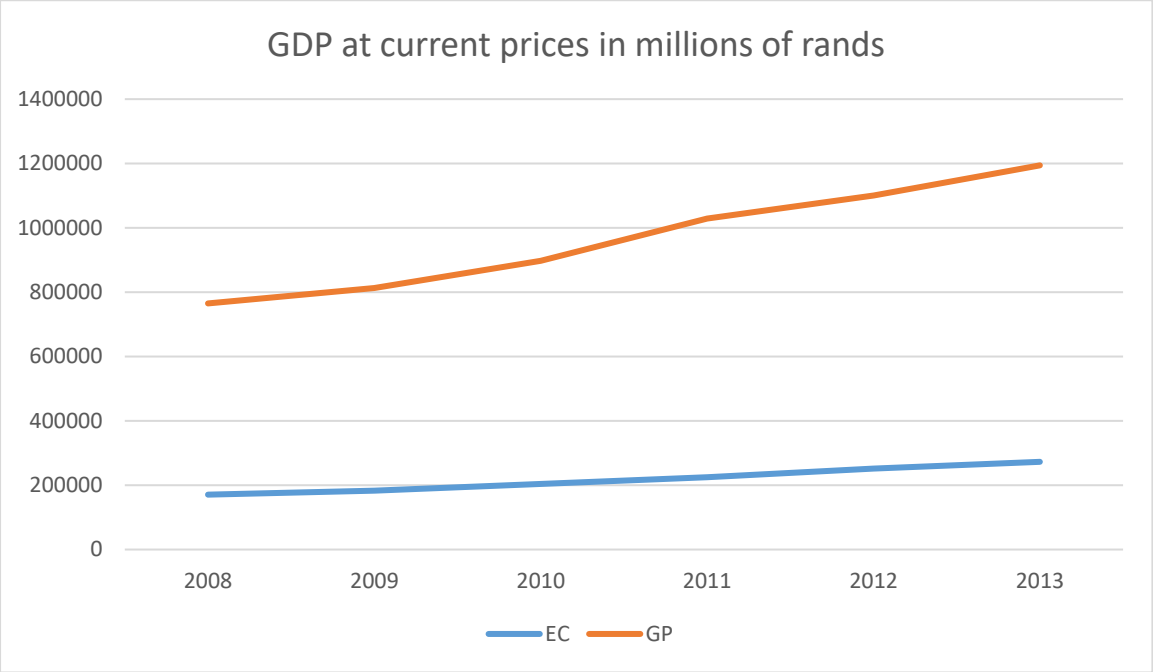
2.4.2 Possible Factors affecting matric pass rates

2.4.2.1 Low Economic Growth

The empirical literature discussed in this study shows how economic growth impacts human development and more specifically human capital. Figure 2.7 shows that the Eastern Cape has a very low Gross Domestic Product compared to Gauteng which has one the highest GDPs in the country.

Figure 2.7 not only indicates how low the GDP of the Eastern Cape has been since 2008 but unlike for Gauteng, it has not been improving. The slow growth in the province can be used to explain all the negative economic problems such as high poverty and inequality in the province. Slow growth in the province can result in a high unemployment rate and a decrease in the demand for labour which can impact the return on labour, and that can affect the investment on education.

Figure 2.7 The GDP of the Eastern Cape and Gauteng



Adapted from Statistics South Africa 2013

2.4.2.2 Poverty

Ramasar, Muller and Tapson (2004) conducted a qualitative participatory survey in Intsika Yethu municipal area in the Eastern Cape in which the respondents reported that 50 percent of the households were poor. Ramasar et al. (2004) defined poverty as having only one all-purpose living space, whose structure was considered a health hazard.

Regarding nutrition, most households respondent that they do not know where the next meal is coming from and are dependent on hand-outs (Ramasar et al., 2004). They have no access to health services, the children are frequently sick and perform poorly at school (Ramasar et al., 2004).

Respondents that fell under the category “better off” reported that they enjoyed marginally better living conditions compared to the respondents who fell under the “very rich” category

who had secured and insured buildings and were targets of crime (Ramasar et al., 2004). The bought food in bulk and could afford domestic workers. Regarding health, they had access to specialist care in the big towns and could afford to keep stocks of liquor for themselves and their friend.

2.4.2.3 Teenage childbearing

According to Makiwane and Chimere-Dan (2010), a study done in the Eastern Cape in 2001 found that a total of 38,8 percent of all teenage women were mothers. 14 percent of all women aged 15 years and more than half (53.8 percent) of those aged 19 years were mothers (Makiwane and Chimere-Dan, 2010). Early teenage motherhood was more among women with no education. Six percent of 15-year-old girls with no formal education were mothers (Makiwane and Chimere-Dan, 2010).

Fifteen years later in 2016, early teenage pregnancy (girls between the years 15 to 19) is the highest in the Eastern Cape out of all the provinces (Sipungu, 2016). It has increased from 5 percent to 5.3 percent in 2016.

2.4.2.4 Health

A report by Blacksash (2010) indicated staff shortages in Storyville which has two nurses working full time and a doctor that visits once a week. If an ill person is unable to be seen by the doctor on the day of his visit, the sick person must then return the following week (Blacksash, 2010). The shortages of staff and the inability to receive medical care can have severe consequences for people's health and thus affect the performance of learners at shool.

2.4.2.5 Growth and poverty

According to the Department for International Development (2008), a flagship study of 14 countries in the 1990s found that over the course of the decade poverty fell in the countries that experienced significant growth and rose in the three countries with low or stagnant growth. On average, a one percent increase in per capita income reduced poverty by 1.7 percent (Department of International Development, 2008).

Studies have found that there a positive correlation between health and growth (Mexican Commission on Macroeconomics and Health, 2004). For example, an increase in life expectancy from 50 to 70 years (a 40 percent increase) would raise the growth by the 1.4 percentage points per year (MCMH, 2004). A 10 percent decrease in malaria was associated

with an increased annual growth of 0.3 percent, and malnutrition causes a decrease in the annual GDP per capita growth worldwide of between 0.23 and 4.7 percent (MCMH, 2004).

According to Ramirez, Ranis and Stewart (1997), where women control cash income, it appears that there is an increase in expenditure towards human development inputs, such as food and education. For example, among Gambian households, the larger the proportion of food under women control the larger the household calorie consumption (Ramirez et al., 1997).

2.5 Conclusion

The empirical literature of this chapter focused on the matric pass rate in the Eastern Cape because it has been consistently low over the past few years, falling way below the national average. The low success rate of matric students in the Eastern Cape is bound to affect the human capital development of the province.

The theoretical literature gave an overview of the importance of human capital on growth and also on the return of investment in education. The government funds the majority of secondary education and if the students don't pass grade 12 well they end up not going to one of the top universities in the country and that will lead to a low-quality workforce.

The empirical literature discussed the effect that economic growth has on economic development indicators such as health and education. The Eastern Cape has high poverty rates which are negatively affecting its population and leading to low growth rates and low production output in the country.

The chapter 3 will focus on the econometric model used in analyse the effect that economic growth has on the pass rate in each province. The results of the model, as well as analysis and interpretation, will be given.

Chapter 3

Research methodology

3.1 Introduction

This chapter presents the empirical framework of the model that will be used in this study. The chapter provides a discussion on panel data model as well as a look and fixed effects and random effects model. The theoretical framework of the model on economic growth and pass rate will also be ended as well as the hypotheses to be tested.

3.2 Empirical model

3.2.1 Panel data model

According to Bell and Jones (2015), the main advantage in using panel data set over a cross section is that it allows greater flexibility in modelling differences in behaviour across individuals.

The basic regression model is in the form:

$$y_{it} = x'_{it}\beta + z'_{i}\alpha + e_{it} \quad (3.2.1)$$

$$= x'_{it}\beta + c_i + e_{it} \quad (3.2.2)$$

There are k regressors in x_{it} not including a constant term. The heterogeniety, or individual is $z'\alpha$ where z_i contains a constant term and a set of individual or group-specificvariable, which may be observed, such as race, sex and locaion or unobserved such as family specific caharacteristics, individual heterogeneity in skill or preferences, all of which are taken to be constant over time t (Bell and Jones, 2015). If z_i is observed for all individuals then the entire model can be treated as an Ordinary Least Squares(OLS).The complication arises when c_i is unobserved which will be the case in most applications (Bell and Jones, 2015).

The main objective of the analysis will be a consistent and efficient estimation of the partial effects.

$$\beta = \delta E\left[\frac{y_{it}}{x_{it}}\right] / \delta x_{it} \quad (3.2.3)$$

The possibility of this depends on the assumptions about the unobserved effects.

The strict exogeniety assumption for the independent variable will be the following:

$$E\left[\frac{e_{it}}{x_{i1,}x_{i2}}, \ldots\right] = 0 \quad (3.2.4)$$

This means that the current disturbances are uncorrelated with the independent variables in every period, past, present, and future.

A more convenient assumption would be mean independence which can be shown as:

$$E\left[\frac{c_i}{x_{i1,}x_{i2}}, \ldots\right] = \alpha \quad (3.2.5)$$

If it turns out that the missing variable is uncorrelated with the included variables, then they may be included in the disturbance model (Bell and Jones, 2015).

The alternative assumption would be:

$$E[\frac{c_i}{x_{i1},x_{i2}}, \ldots] = h[x_{i1},x_{i2}, \ldots] \quad (3.2.6)$$

$$= h[x_i] \quad (3.2.7)$$

3.2.2 The fixed effects model

To avoid the problem of heterogeneity bias, all higher-level variance and with it any between effects are controlled out using the higher-level entities themselves including in the model as dummy variables Dj (Bell and Jones, 2015).

$$y_{ij} \sum_{j-1}^{j} \beta_{0j} D_j + B_1 x_{ij} + e_{ij} \quad (3.2.8)$$

To avoid having to estimate a parameter for having higher-level unit, the mean for a higher level entity is taken away from both sides of the previous equation such that:

$$(y_{ij} - \bar{y}_i) = \beta(x_{ij} - \bar{x}_i) + (e_{ij} - \bar{e}_j) \quad (3.2.9)$$

Bell and Jones (2015) emphasise that the fixed effects model only estimates with effects so they cannot suffer from heterogeneity bias.

3.2.3 The random effects model

According to Schmidheiny (2016) in the random effects model, the individual-specific effect is a random variable that is uncorrelated with the explanatory variable.

Unrelated effects:

$$E[C_i/X_i,z_i]=0 \quad (3.2.10)$$

Schmidheiny (2016) explains that equation 3.2.10 assumes that the individual-specific effect is a random variable that is uncorrelated with the explanatory variables of all past, current and future time periods of the same individual.

Effect variance

$V [C_i/X_i,z_i] = \sigma_c^2 < \infty$ (Homoscedasticity) (3.2.11)

$V [C_i/X_i,z_i] = \sigma_c^2, i(X_i,z_i) < \infty$(heteroscedastic) (3.2.12)

Re: assumes constant variance of the indivdual specific effect.

Identificability

Rank (W) = k + m + 1 < NT and $E [W_i'W_i] = Qww$ is p.d and finite.

The typical element $W_{it}' = [1x_{it}'z_t']$.

Rank (W) = k +m + 1<NT and $E[W_i'\Omega_i^{-1}W_i] = Qwow$ is p.d and finite.

RE: assumes that the regressors including a constant are not perfectly collinear that all regressors (but the constant) have zero variance and not too many extreme values (Schmidheiny, 2016).

The random effects model can be written as:

$Y_{it}=\alpha + x_{it}'\beta + z_t'\gamma+v_{it}$ (3.2.13)

Where $v_{it}= c_i+u_{it.}$ (3.2.14)

3.2.4 The Hausman test

O'Brien and Patacchini (2006) define the hausman test is the standard procedure used in empirical panel data analysis in order to descriminate between the fixed effects and random effects model.

Suppose we have two estimates for a certain parameter θ of dimensiom k×1. One of them; $\widehat{\theta_r}$ is robust i.e consistent under both null hypothesis H_0 and the alternate $H_,$ the other $\widehat{\theta_e}$ is efficient and consostent under the H_0 but inconsistent under H_1. The difference between the two is then used as the basis for testing.

Under appropriate assumptions under H_0 the statistic h based on $\left(\widehat{\theta_R} - \widehat{\theta_e}\right)$ has a limiting chi-squared distribution $h= (\widehat{\theta_r}-\widehat{\theta_e})' \left[\widehat{Var}\left[\widehat{\theta_r} - \widehat{\theta_e}\right]^{-1} (\widehat{\theta_r} - \widehat{\theta_e}) \overset{a}{\sim} \chi_K^2\right.$. (3.2.15)

If this statistic lies in the upper tail of the chi-square distribution we reject H_0. If the variance matrix is consistently estimated the test will have power against any alternate under which $\widehat{\theta_r}$is robust and $\widehat{\theta_e}$is not.

Under appropriate assumptions:

Var $\left(\widehat{\theta_r} - \widehat{\theta_e}\right)$= Var $(\widehat{\theta_r})$- Var $(\widehat{\theta_e})$. (3.2.16)

But using:

Var $\left(\widehat{\theta_r} - \widehat{\theta_e}\right)$ = Var $(\widehat{\theta_r})$ -2 Cov $(\widehat{\theta_r},\widehat{\theta_e})$ + (Var$(\widehat{\theta_e})$) may be more consistent.

3.3 Theoretical model

The study uses the panel data (random effects) model to measure the effects that economic growth in each province has on the pass rate. The data was collected over a six-year period from the year 2008 to 2013.

The pass rate data was collected from The Department of Basic Education, and the GDP growth rate was captured from Statistics South Africa.

The model is written as:

Pass rate = α +EC+FS+ GT+ NW+ NC+ WC+LIMP+MP+KZN

Where pass rate is the independent variable and

The hypotheses to be tested are:

Null hypothesis Ho: Economic growth does have an effect on the matric pass rate in South Africa.

Alternative hypothesis Ha: Economic growth does not have an effect on the matric pass rate in South Africa.

E-views was then used to run the random effects model and measure the effects that the GDP of each province has on the pass rate for each province.

The researcher expects that the GDP growth rate of each province will have a positive effect on the pass rate of each province as suggested by economic theory that indicates that economic growth leads to economic and human development.

3.4 Conclusion

The methodology chosen by the researcher was outlined in this chapter. A random effects and the fixed model were explained in detail to describe the method that will be used to run the model. a Hausman test was added as it can be used to help the researcher chose between a fixed effects or random effects model.

The empirical model gave a mathematical background to the model and explained the process that will be used to run the model. The theoretical model offered a more in-depth explanation of the model that will be run in the following chapter as well as the hypotheses to be tested.

Chapter 4

Analysis and results

4.1 Introduction

This chapter presents the results of the model that was presented in the previous chapter as well a discussion of the findings from the model. An analysis of similar studies will also be discussed to support the findings from the model. The main focus of this chapter is on the hypothesis test on each variable as that will help the researcher give recommendations on the findings of the model.

4.2 Results and analysis of the model

4.2.1 Results of the Hausman test

Table 5.1 the results of the Hausman test

Test cross-section random effects			
Test summary	Chi-squared Statistic	Chi-squared d.f	Probability stastistic
Cross-section random	0.000000	4	1.0000

The null hypothesis: The random effects model is appropriate.

The alternative hypothesis: The fixed effects model is appropriate.

The results of the Hausman test shows that we cannot reject the null hypothesis at the five percent confidence level. This means that the random effects model is more appropriate for the data.

4.2.2 The results of the OLS random effects estimation

Using the Eviews 9.5 statistical package a panel data random effects model was run and produced the following results:

Table 5.2 The results of the random effects model

Variable	Coefficient	Probability statistic
EC	-3.429560	0.0525
FS	2.114784	0.0819

GT	2.445394	0.0227
KZN	0.008120	0.9954
LIMP	-1.468475	0.2874
MPL	-0.369363	0.8538
NC	1.819933	0.2358
NW	0.859720	0.4174
WC	1.345706	0.3062
C	68.55051	0.0000

R-squared	0.287988
Sum squared residual	4226.058
Mean dependent variance	69.66852
Durbin-Watson statistic	0.076573

4.2.3 Analysis of the results

- The Eastern Cape (EC) variable:

Null hypothesis Ho: Economic growth does have an effect on the matric pass rate in the Eastern Cape.

Alternative hypothesis Ha: Economic growth does not have an effect on the matric pass rate in the Eastern Cape.

The coefficient for the Eastern Cape economic growth (-3.429560) is not statistically significant at the 5 percent level. This means that we cannot reject the null hypothesis. We conclude that economic growth does have an impact on the matric pass rate in the Eastern Cape.

The coefficient is also negative meaning that economic growth in the Eastern Cape leads to a negative matric pass rate. This indicates that there are many other factors in the Eastern Cape that are contributing to the low matric pass rate.

The coefficient for the Eastern Cape is also much larger than that of other provinces indicating that the impact of economic growth in the Eastern Cape on the pass rate is greater than that of the other provinces.

- The Free State (FS) variable:

Null hypothesis Ho: Economic growth in the Free State does have an effect on the matric pass rate in the Free State.

Alternative hypothesis Ha: Economic growth in the Free State does not have an effect on the matric pass rate in the Free State.

The coefficient for the economic growth in the Free State (2.114784)) is not statistically significant at the 5 percent level. This means that we cannot reject the null hypothesis. We can conclude that economic growth in the Free State has a positive effect on the pass rate.

- The Gauteng (GT) variable:

Null hypothesis Ho: Economic growth in Gauteng does affect the pass rate Gauteng.

Alternative hypothesis Ha: Economic growth in Gauteng does not affect the pass rate in Gauteng.

The coefficient for the economic growth in Gauteng (2.44539) is statistically significant at the 5 percent level. This means that we reject the null hypothesis and conclude that economic growth in Gauteng does not affect the pass rate.

- The Kwa-Zulu Natal (KZN) variable:

Null hypothesis Ho: Economic growth in Kwa-Zulu Natal affects the pass rate.

Alternative hypothesis Ha: Economic growth in Kwa-Zulu Natal does not affect the pass rate.

The coefficient for Kwa-Zulu Natal (0.008120) is not statistically significant at the 5 percent level. Therefore we cannot reject the null hypothesis. We can conclude that economic growth in Kwa-Zulu Natal does have a positive effect on the pass rate.

- The Limpopo (LIMP) variable:

Null hypothesis Ho: Economic growth in Limpopo affects the pass rate.

Alternative hypothesis Ha: Economic growth in Limpopo does not affect the pass rate.

The coefficient for Limpopo (-1.468475) is not statistically significant at the 5 percent level, meaning that we cannot reject the null hypothesis. This means that the economic growth of Limpopo negatively affects the pass rate in the province.

- The Mpumalanga (MP) variable:

Null hypothesis Ho: Economic growth in Mpumalanga affects the pass rate.

Alternative hypothesis Ha: Economic growth in Mpumalanga does not affect the pass rate.

The coefficient for Mpumalanga (-0.369363) is not statistically significant at the 5 percent level, meaning we cannot reject the null hypothesis.

This means that the economic growth of Mpumalanga has a negative effect on the pass rate because of the negative coefficient indicating that there are other factors influencing the pass rate in Mpumalanga.

- The Northern Cape (NC) variable:

Null hypothesis Ho: Economic growth in the Northern Cape affects the pass rate.

Alternative hypothesis Ha: Economic growth in the Northern Cape does not affect the pass rate.

The coefficient for the Northern Cape (1.819933) is not statistically significant at the 5 percent level, meaning we cannot reject the null hypothesis. We can conclude that economic growth positively affects the pass rate in the Northern Cape.

- The North West (NW) variable:

Null hypothesis Ho: Economic growth in North West affects the pass rate.

Alternative hypothesis Ha: Economic growth in North West does not affect the pass rate.

The coefficient for the North West (0.859720) is not statistically significant at the 5 percent level, meaning we cannot reject the null hypothesis.

- The Western Cape (WC) variable:

Null hypothesis Ho: Economic growth in Western Cape affects the pass rate.

Alternative hypothesis Ha: Economic growth in Western Cape does not affect the pass rate.

The coefficient for the Western Cape (1.345206) variable is not statistically significant at the 5 percent level, meaning we cannot reject the null hypothesis. We can conclude that economic growth in the Western Cape does affect the pass rate.

4.2.4 Possible factors affecting pass rates

The results of the random effects models show that a large proportion of pass rates in the different provinces is not explained by economic growth. This means that there are other reasons that are causing low pass rates in some provinces.

The results of my model are supported by the following studies:

4.2.3.1 Poverty

Poverty in South Africa can impact the educational performance of learners. For example, a study by Sum and Fogg (1991) found that poor students are ranked in the 19^{th} percentile on assessments while students from a middle-income family ranked in the 66^{th} percentile.

A study done in Zimbabwe by Moyo (2013) found that students had to walk long distances to school. Around 30 percent of the students interviewed had to walk between 4 to 6 kilometres to school. Another finding by Moyo (2013) was that 24 percent of the students interviewed revealed that they had only one meal a day. Walking long distances to school and not getting enough food can directly affect a student's health as well as school performance.

4.2.3.2 Lack of funding in schools:

Mushaeni (2008) did a study on the analysis of the factors influencing grade 12 results and found that 83 percent of the principals that were interviewed about their assessment of the school's funding, for both high-performing schools and poorly performing schools, stated that their schools were not adequately funded.

Funding is very important for schools as it can affect whether students receive textbooks, computers and salaries of teachers. A school with inadequate funding cannot function to its peak and may result in low pass rates.

4.2.3.3 Classroom sufficiency:

Mushaeni (2008) also discovered that some schools do not have enough classrooms for all the students. Most of the principals and teachers interviewed complained that they did not have enough classrooms at their schools.

Nkanzela (2016) found that the majority of grade twelve learners in Mbizana district in the Eastern Cape reported that their classrooms were overcrowded causing insufficient space for them to do some classroom-based activities such as group work.

4.2.3.4 Science laboratory availability

The principals of the schools included in Mushaeni's (2008) study also complained about the lack of laboratory equipment. Even the urban schools complained about the lack of equipment and felt that the presence of science laboratories does not contribute positively to learner performance. They complained about the presence of laboratories without equipment. Students in the Mbizana district in the Eastern Cape indicated that they lacked science laboratories and libraries (Nkanzela, 2016).

4.2.3.5 Educator knowledge

Makgato and Mji (2006) found that 40 percent of educators that participated in their study complained about experiencing a content gap in the subjects they were teaching. Some of the learners complained that the teachers do not explain the subjects very well or end up repeating previous years' work. Other learners indicated that when they ask the teachers for help with a specific topic, they do not get assistance This could be caused by the utilisation of under- and unqualified educators.

4.2.3.6 Motivation and interest

Another finding my Makgato and Mji (2006) was that learners did not seem to identify shortcomings from their side. Blame was for example apportioned to educators, a lack of textbooks and even the school (Makgato and Mji, 2006). If learners do not take responsibility for their education that will negatively affect their performance.

4.3 Conclusion

The results of the random effects model show that economic growth has an impact on the pass rate all the provinces except Gauteng. The model shows that improving the economic growth in each province can have a positive effect on the pass rate except in the Eastern Cape, Limpopo and Mpumalanga. These three provinces reveal that there are other factors that are affecting pass rates such as lack of classrooms, lack of funding and poverty among others.

Chapter 5

Recommendations and conclusion

5.1 Introduction

The random effects estimation of the model of economic growth and pass rates indicated that there are more factors that affect matric pass rates in each of the provinces. After analysing the results, the researcher concluded that increased growth rates are not sufficient in improving matric pass rates other factors must also be addressed. This chapter discusses the recommendations based on the results obtained from the model.

5.2 Recommendations

5.2.1 Improve Economic growth

The main finding in this study was that economic growth has a positive impact on the pass rate in most provinces. One way to improve economic growth in South Africa is to increase savings and investments. In the Solow model discussed in the theoretical literature, it was shown that increased saving and investment leads to more growth. According to the United Nations (2012) for developing countries to reach a higher level of long-term growth that has to invest more in fixed capital.

The African Development Bank (2012) believes that to attain middle-income levels, Africa must double its investment in infrastructure. African countries invest around 2 to 3 percent of their GDP in infrastructure compared to the 9 percent that China invests in infrastructure (AFDB, 2012).

Another way to improve economic growth is to promote competition in the economy. The government has to provide a business environment that is competitive and has minimal barriers to entry and fewer taxes on companies.

5.2.1.1 Increase economic activity in the Eastern Cape

The results of the random effects model showed that the economic growth in the Eastern Cape influences the pass rate. The government must try and stimulate the Eastern Cape economy to create more jobs and improve the standard of living of the people in the province.

5.2.1.2 Increase foreign investment in the provinces

The matric results of Gauteng province are higher than for the other provinces and the model shows that increasing economic growth n the province wont necessarily improve the matric results. Gauteng is a province that has much higher investment and economic activity than the other provinces.

5.2.2 Reducing poverty in the Eastern Cape

One way to improve the performance of students in schools is to reduce poverty. The government has to improve service in the rural areas to help improve living conditions. For example, building schools near homes or building new roads can help reduce the number of children travelling long distances to get to school.

Children who do not have enough food to eat can't be expected to perform well at school, and so the government needs to do more to support the schools in proving additional meals to hungry children.

5.2.3 Increase funding for schools

The negative variable for Mpumalanga from the model shows that increasing economic growth leads to a decrease in the pass rate. This means schools and learners in Mpumalana face more chalenges that are affecting the pass rate. To help these scchools overcome the challemges the government needs to increase the funding of schools in rural areas. Provinces like the Eastern Cape and Mpumalanga need more support by the government to improve their education system.

More money needs to be allocated to increasing the salaries of teachers to attract more qualified teachers. Money is also needed to support the feeding scheme that most schools have that provide meals to poor children.

5.2.4 Reduce the unemployment rate

Creating more employment for the poor can help improve the living conditions of poor students. Parents that have jobs can provide food and shelter for children. A lower unemployment rate also serves as an incentive for parents to invest more in their children’s education and that can lead to an improvement in the performance of learners.

5.2.5 Building more classrooms

Increasing the number of classrooms in schools would solve the problem of overcrowding. Learners who do not have proper classrooms will find it difficult to have classes under tough weather conditions.

5.2.6 Educator knowledge

The skills of teachers in public schools have to be improved. The government can introduce in-service training opportunities as well as workshops to try and improve the skills and knowledge of teachers.

5.3 Recommendations for future research

This study focused mainly on the impact that economic growth has on the pass rates of the different provinces in South Africa. The study did not take into consideration any other macroeconomic factors that could possibly affect pass rates. Studies can also be done at the various schools in poor performing provinces like the Eastern cape to better understand the microeconomic factors that are causing the low pass rate. Interviews and surveys can be conducted at the various public and private schools in South Africa to reveal more factors that are causing the poor performance of learners.

5.4 Conclusion

The matric rate in South Africa has not been improved much over the years. Provinces like the Eastern Cape have had a pass rate that has consistently been below the national average. For example, some of the provinces that have low pass rates have been accompanied by low productivity. This study was aimed at measuring the effect that economic growth has on the matric pass rate of each province to determine how much of the pass rate can be attributed to the low growth.

The findings of this study have to be interpreted with caution as the model used only had one regressor which was economic growth. This lead to a low R^2 of around 24 percent indicating that there are many factors that affect the pass rate, in the different provinces, that were not included in the model.

The main finding of this study was that economic growth in each province leads to a positive Matric pass rate except the Eastern Cape, Limpopo and Mpumalanga. The negative coefficient

from those provinces suggests that as growth increases in each province the matric pass rate decreases. This finding indicates that there are many other individuals or school-specific factors that are contributing to the matric pass rate. These factors include poverty, the lack of classrooms, the lack of better-qualified teachers, the lack of funding and student motivation.

The recommendation from this study is that if the government has to improve the economy in South Africa to improve the well-being of its population. The level of saving and investment in fixed capital has to be increased to promote long-term growth. The government has to increase job opportunities for the poor to reduce unemployment. Poverty and inequality have to be reduced to improve the performance of students. The government has to improve service delivery in poor areas as that is an important factor in improving students performances.

REFERENCE LIST

Acemoglu, D. & Autor, D. 2011. Lectures in labour economics. MIT Press

Almendarez, L. 11 October 2011. Human capital theory: Implications for educational development.[online]Available from http://www.open.uwi.edu/sites/default/files/bnccde/belize/conference/papers/papers2010/almedarez.html

Badat, S. 2010. The challenges of transformation in higher education and training institutions in South Africa. The development Bank of Southern Africa.

Barker, F. 2007. The South African labour market (5th ed.). Hatfield. PTA: Van Schaik Publishers

Baum, S. & Ma, J. & Payea, K. 2013. Trends in higher education series. The benefit of higher education for individual and society. College Board.

Bell, A. & Jones, K. 2015. Explaining Fixed Effects: Random Effects Modeling of Time-Series Cross-Sectional and Panel Data. Political Science Research and Methods, 3(1), 133-153.

Birdsall, N. & Ross, D. & Sabat, R. 1 September 1995. Inequality and Growth Reconsidered: Lessons from East Asia [Online]. Available from: https://academic.oup.com/wber/article-abstract/9/3/477/1666838/Inequality-and-Growth-Reconsidered-Lessons-from?redirectedFrom=fulltext (accessed: 1 December 2016)

Bloom, D. E. & Canning, D. & Chan, K & Luca, D. L.2014. Spurring economic growth in Africa: The role of higher education. Chronicle of African Higher Education.

CHE. 2013. A proposal for undergraduate curriculum reform in South Africa: The case for a flexible curriculum structure. Pretoria: Council on Higher Education.

DeAngelo, L. & Franke, R. & Hurtado, S. & Pryor, H.J & Tran, S. 2011. Completing college: Assessing graduation rates at four-year institutions. Higher Education Research Institute.

Eastern Cape Provincial Health Consultative Workshop: a community consultation workshop report. 2010. Port Elizabeth, Eastern Cape Province: Black Sash.

Eastern Cape Socio-Economic Consultative Council. February 2016. A perspective on the 2015 Eastern Cape Matric Results [Online]. Available from: http://www.ecsecc.org/documentrepository/informationcentre/ecseccdataseriesnsc2015_11591.pdf (accessed: 15 December 2016)

Embassy of the United States of America. June 2012. Better Infrastructure Brings Economic Growth [Online]. Available from: http://photos.state.gov/libraries/amgov/133183/english/P_Infrastructure_Brings_Economic_Growth_English.pdf

Faulkner, D. & Loewald, C. & Makrelov, K. 2013. Achieving Higher Growth and Employment: Policy options for South Africa (Report no. 334). Cape Town, South Africa: Economic Research Southern Africa.

Fisher, G. & Scott, I. 2011. Closing the skill and technology gap in South Africa. The role of higher education in closing the skills gap in South Africa, The World Bank.

Ferrira. 2015. Lets talk development. [Online], Available http://blogs.worldbank.org/development talk/international-poverty-line-has-just-been-raised-190-day-global-poverty-basically-unchanged-how-evn. (Accessed 25 April 2016).

Festus, L. Kasongo, A. Moses, M. & Yu, D. 2015. The South African labour market 1995-2013 (Report 493). Economic Research South Africa.

Florides, A. 1995. Human capital: A theoretical outline.

Goldin, G. 2014. Human capital. Handbook of cliometrics. Howard University.

Great Britain. Department for International Development. 2008. Growth: Building jobs and prosperity in developing countries [Online]. Available from: www.eldis.org/go/home&id=37900&type=Document (accessed: 6 December 2016).

Gregor, K. 21 June 2014. [Online] Available from http://www.worldnews.com/article.pnh? Story=2014062015083621 (Accessed: 28 February 2016)

Gujarati, D, N. & Porter, D.C. 2009. Basic Econometrics (5th ed.). New York: McGraw-Hill.

Hanushek, E. A. & Wobmann, L. 2007. Education Quality and Economic Growth. Washington D.C, USA: The International Bank for Reconstruction and Development.

Jarab. 2006. The politics of European university identity-political and academic perspectives. In J. Avikso et al (Ed), Proceedings of the seminar of the Magna Charta Observatory.Bologna.

Joines, D. H. 1999. Economic Growth. South Carolina, USA: Marshall School of Business.

United Nations. 2012. Macroeconomic policies to promote growth and job creation. New York, USA: UNCTAD.

Kirk, D. 1 December 2010. Causes of unemployment in South Africa [Online] Available from http://www.twentythirdfloor.co.za/2010/12/01/causes=of-unemployment-in-South-Africa/ (Accessed: 28 February 2016)

Makgato, M. & Mji, A. 2006. Factors associated with high school learners' poor performance: a spotlight on mathematics and physical science. South African Journal of Education, 26(2), 253-266.

Makiwane, M. B. & Chimere-Dan, D. O. D. 2010. The People Matter. The State of the Population in the Eastern Cape. Bisho, Eastern Cape. Department of Social Development.

Mouton, N. & Louw, G.P & Strydom, G.L.2013. International business and economics research journal. Present-day dilemmas and challenges of the South African tertiary system, 12(3).

Mexican Commission on Macroeconomics and Health. 2004. Investing in health for economic development. Mexico: University of America, Puebla.

Moyo, W. 2013. Causes and effects of poverty on academic achievement of rural secondary school students: Case of Thazi Secondary School in Insiza District, 3(10), page 2104-2113.

Murray, M. 2014. Graduation and student drop-out rates. Factors affecting graduation and student dropout rates at the University of Kwazulu-Natal. Durban, University of Kwazulu-Natal

Mutshaeni, H. N. 2008. An analysis of factors influencing grade 12 results. University of Pretoria, Pretoria.

Nagler, J. 1994. Probit analysis. Unpublished manuscript.

Nkanzela, D. N. 2015. Factors Contributing To Low Academic Performance Of Grade Twelve Learners In Mbizana District. OR Tambo District, Eastern Cape.

O'Brien, R. & Patacchini, E. 2006. The Hausman Test for Correlated Effects in Panel Data Models under Misspecification. England, UK: University of Southampton, School of Social Sciences, Economics Division. Rome, IT: University of Rome, Faculty of Statistics.

Phurutse, M. C. 2005. Factors Affecting Teaching and Learning in South African Public Schools. Cape Town, South Africa: Human Science Research Council.

Poteliene, S. & Tamasauskiene, Z. 2013. Human capital investment: Measuring returns to education. Social research, 4(33), 57-58.

Pouris, A. & Inglesi-Lotz, R. 2014. South African journal of science. The contribution of higher education institutions to the South African economy. 110(4) p1-2.

Princeton University. 1996. Human Development Report (Report no. 11). New Jersey, USA: The Trustees of Princeton University.

Ramasar, V. & Muller, E. & Tapson, D. 2004. Eastern Cape State of the Environment Report. Durban, South Africa: CSIR Division of Water, Environment and Forestry Technology.

Ramdass, K. 2009. The challenges facing education in South Africa. Pretoria, University of Johannesburg.

Ramirez, A. & Ranis, G. & Stewart, F. 1997. Economic Growth and Human Development (Report no. 787). New Haven, CT: Economic Growth Centre.

Ramirez, A. & Ranis, G. & Stewart, F. 1998. Economic Growth and Human Development (Report no. 18). New Haven, CT: Yale University, QEH.

Reddy, V. & Van der Berg, S. & Janse van Rensburg, D. & Taylor, S. 2012. Educational outcomes: Pathways and performance in South African high schools (Report no. 620). Durban, South Africa: Human Science Research Council, Education and Skills Development Research Programme.

Saulnier, R. J. 1963. Factors in economic growth. Columbia, USA: Barnard College, Columbia University.

Schmidheiny, K. 2016. Short Guides to Microeconometrics. University of Basil.

Sipungu, T. 2016. A Brief Review of the Performance of the Eastern Cape in terms of the Statistics South Africa Community Survey 2016. Eastern Cape, South Africa: Public Service Accountability Monitor.

Statistics South Africa. 2014. Poverty Trends in South Africa: An Examination of absolute poverty between 2000 and 2011. Pretoria. Statistics South Africa.

Statistics South Africa. 2015. Quarterly labour survey. Pretoria. Statistics South Africa.

Sum, A. 1991. The Adolescent Poor and the Transition to Early Adulthood. Centre for National Policy, U.S.

Sun, P. & Heshmati, A. 2010. International Trade and its Effects on Economic Growth in China (Report no. 5151). Bonn, Germany: The Institute for the Study of Labor.