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Human Capital Investment through Education: The way to an equitable middle class in South Africa

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Just 25 years ago South Africa shifted from a police state based around a system known as Apartheid, a system of segregation on the grounds of race, to a democracy. With the establishment of democracy came the introduction of capitalism. This new economic system began to open doors previously unavailable to much of the South African population. Under Apartheid white South Africans passed laws to ensure their dominance, regulating every aspect of society from businesses to housing and education, policies were in place to limit mobility. This left their non-white counterparts at an extreme economic disadvantage, resulting in a nation with virtually no middle class. But the fall of Apartheid and the introduction of capitalism turned the tables, for the first time non-white South Africans were able to participate in an open economy with no discriminatory policy holding them back. This combination of shifting racial and class dynamics led to the development of a multiracial middle class for the first time in the nation's history, specifically one consisting of black South Africans. However, the years of economic repression under Apartheid are still felt throughout all of South Africa today and can be seen manifesting in high levels of income inequality and limited class mobility. Though efforts have been made to stimulate and promote this developing class's growth, the polices in place have not had the effects needed to truly create a strong middle class for the nation. Seen through the stagnate size of the middle class over time compared to their upper- and lower-class counterparts.

From 1948 to 1994 black South Africans were completely stripped of their citizenship, taking all their economic rights as well. With the passing of the Bantu Education Act of 1952 separate education systems were created. Under this, black children were required to attend state-run schools which prepared them for jobs in manual labor and established universities were prohibited from admitting non-white students. This caused an entire generation of South Africans to receive a limited education causing for a large, long-run loss in human capital development. This has led to generations of South Africans experiencing a heavy disadvantage that was never fully addressed.

Since 1994, the majority of policies passed have been rooted in attempts to grow and support black businesses, grow employment opportunities, and eliminate race-based discrimination in the work force; but this approach is not producing the effects hoped for. Making it transparent other entities of society must be explored and invested in. This leads to the research question of: how would the introduction of education-based growth policies could directly address the inequality in educational experiences found across racial groups in South Africa in order to help stimulate economic growth and improve class mobility? I hypothesize if South Africa passed polices that raised investment in education the growth rate of the black middle class would see an increase due to the improvement in class mobility.

The focus of this paper is to explore and examine the impacts of education-based investment on the growth of the developing South African black middle class. Showing that an increase in educational investment will simulate higher levels of economic growth than the policies previously passed. In the coming chapters this paper will examine theoretical framework that focuses on different growth theories and models that help explain the impact an increased

investment in education has on economic development, before diving into the current literature surrounding the topic and then moving on to how the hypothesis will be tested empirically through several OLS regressions.

Current literature surrounding the topic has been focused on the poor growth of the black middle class, and the still visible achievement gaps between races in South Africa. While some effort has been made to promote the growth of the black middle class since the end of Apartheid, no polices have paid attention to the human capital aspect of economic growth. This has led to the South African education system failing to come close to achieving equitable educational access. Through theoretical economic framework emphasizing growth theories and models the need for educational investment will be explained and connected back to the context of South Africa. Showing that human capital is a driving economic force and needs to be invested in to create the strong middle class that South Africa is missing.

To further show this hypothesis, three regressions will be estimated with the dependent variables of total income, poverty rate, and middle income to help gauge the real impact educational attainment has on earnings. Through those regressions the findings show a clear racial inequity in the education system in how it relates to income. Those findings support the hypothesis that lacking and unequitable education system inhibits economic movement of black South Africans. In the next chapter the theoretical framework will be explored, giving reason as to why this connection between lacking human capital investment and stagnant class growth is present.

II. Theoretical Framework

Since the end of apartheid in South Africa, the economic constraints in place from the era have been revoked and efforts have been made to equalize the economic playing field between races. While the two main policies passed, the ANC's Growth, Employment, and Redistribution (GEAR) and the 1994 Reconstruction and Development Program (RDP), have been centered around economic growth and redistribution in the form of promoting black owned business, and job creation through public works projects. It has become clear other routes must be taken to further stimulate the development of the South African middle class. However, in the case of South Africa the years of repressive economic policy have led to huge gaps in the development of human capital, as only whites had access to all the tools necessary for decades. In introducing policy to promote black businesses that were already in place, the South African government missed the opportunity to expand and grow the black middle class. The introduction of education-based growth policies would directly stimulate economic growth and improve class mobility through the development of human capital. This chapter aims to show that an increase in education growth policies would lead to an increase in the middle class due to class mobility.

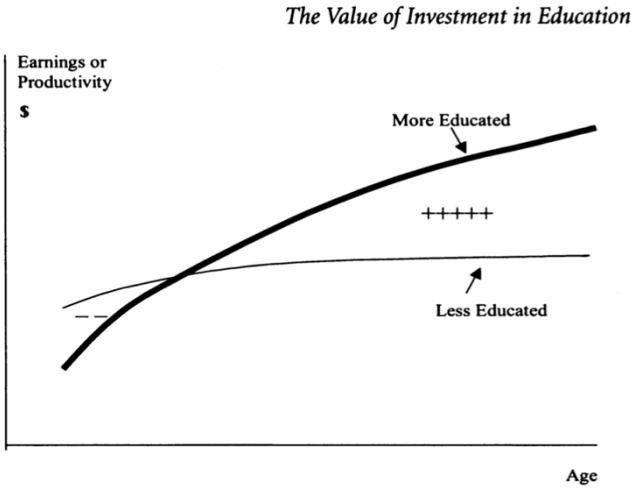
In his work *Wealth of Nations*, Adam Smith states

a man educated at the expense of much labor and time… may be compared to one... expensive machine… The work which he learns to perform... over and above the usual wages of common labor, will replace the whole expense of his education

While the benefits of an educated population were spotted by Smith early on, this mutually beneficial relationship between education and economic growth in the field of human capital did

not truly enter economic theory until the 1960s. During this period national income was growing at a far faster rate of growth than the traditional factors of production, leading Theodore Schultz to introduce his theory that investment in human capital was the factor needed to explain this puzzle. Gary Becker and Jacob Mincer took this theory and ran with it, developing a model that shows the benefits of human capital investment in the long run (Psacharopoulos 2006, 115). This investment in human capital can be seen modeled in terms of education in *Figure 1.*

Figure 1: Education Levels and Earnings



Source: Psacharopoulos, G. (2006). The Value of Investment in Education: Theory, Evidence, and Policy. Journal of Education Finance, 32(2), 115

Becker and Mincer's model shows that the formation of human capital does entail a sacrifice of resources today, but in the end the benefits from this investment will out way any sacrifice made. In *Figure 1,* one can see that the more educated worker makes sacrifices early on in their career to receive training, which is why their earnings are lower than their less educated counterparts at that time. But once the training period is over, represented in the model by the intersection of the two workers' production functions, the trained worker is far more productive in their lifetime. While education is different than other aspects of human capital, as students incur not only indirect costs such as lost earnings, but direct costs as well such as tuition. (Psacharopoulos 2006, 116).

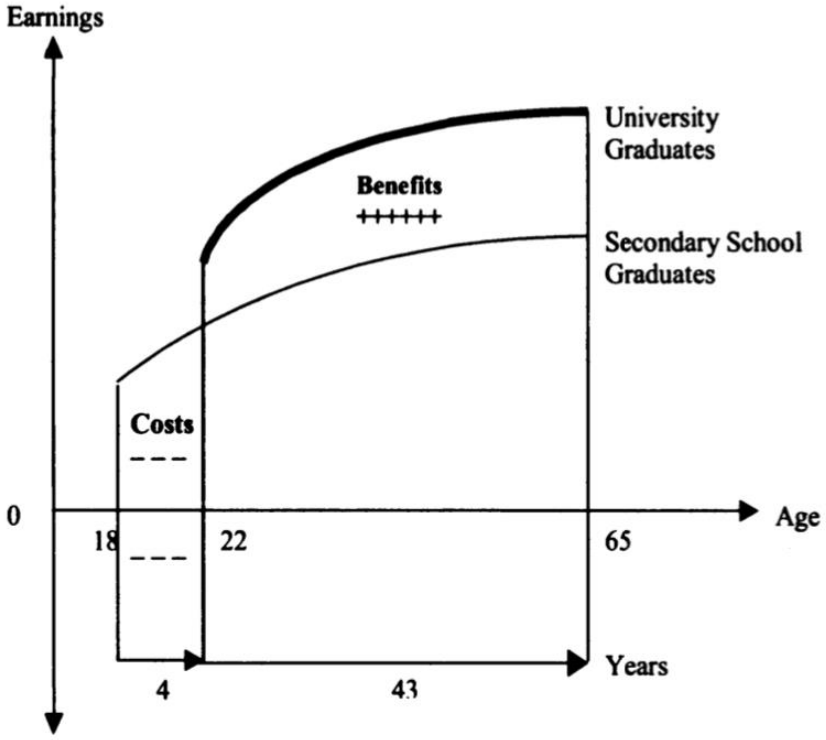


Figure 2: Age-earning Profiles of Secondary School and University Graduates

Source: Psacharopoulos, G. (2006). The Value of Investment in Education: Theory, Evidence, and Policy. Journal of Education Finance , 32(2), 116

The impacts of those direct costs are modeled in *Figure 2.* While students do incur those direct costs during their years of schooling as soon as they enter the work force their earnings are higher than those who did not forward their education. This demonstrates that education is a factor of economic growth that falls into the human capital category. In the case of South Africa, one would expect those benefits to be modeled differently for different racial groups. While white South Africans would most likely see benefits to their earnings right after their completion of higher university as modeled in the figure, this will most likely not be the case for black South Africans. Their benefits from education would most likely be modeled through a more horizontal line with a flatter slope rather than a concave one. In part due to the inequality in the education system in place which prevents black South Africans from receiving the same education as their white counter parts, preventing their earnings from seeing the same rapid increase.

When looking at ways to impact the growth of the black middle class in South Africa, investing in education could transform this developing class. The previous figures show how higher education raises income levels, while increasing the overall human capital of a country over time. Human capital itself is a key and driving force when it comes to economic growth and is heavily factored into all modern growth theories. In the case of South Africa, the non-white population lacked development under the umbrella of human capital due to the laws of apartheid.

The post-apartheid South African government should be making up for those losses by placing further investment in human capital. Increased government investment in the South African school system combined with further interest toward equalizing the system for all students will lead to a higher quality more equal education system. *Figure 2* shows how this increase in overall education leads to higher earning rates. In South Africa an increase in this education, not only on a primary level, but a secondary one as well would lead to a rise in the average household income over time. This rise in income would allow for further investment in education from a younger age which would create a generation of higher earners and allow for more class mobility and therefore a higher middle class growth rate seen through this increase in income.

II.A. Growth Theories

To fully address and understand the implications this investment in education would bring to South Africa's growth multiple theories will be used to explore this relationship. The different growth theories explained in this section break down possible conditions needed for growth to occur. Each theory examines growth possibilities through a different lens, combining different assumptions and variables creating a model. While not every theory is applicable to measuring growth in our current world economy, understanding each theory is key to piecing together the importance of human capital in development and growth. The section will start by discussing neoclassical theories, focusing on the Solow model. This model is key for the context of South Africa as it allows for human capital development to be factored in and measured. Then Endogenous Growth Theory will be discussed through the AK model. This theory furthers the Solow model putting it into a Cobb-Douglas production function allowing for government polices to impact growth. The section ends with a discussion of the middle-income trap, to allow for context behind the stunted middle-class growth. All those theories and models are incredibly valuable when looking at the case of South Africa and the polices that are in place and those that should be implemented. However, to fully understand the impacts of each of the different growth theories it is necessary to break each theory down individually.

Neoclassical Growth Theory

The neoclassical growth theory outlines how steady economic growth is driven by three forces labor, capital, and technology. While the original model of this long run economic growth theory was first published in 1956 by Robert Solow and Trevor Swan, the model itself initially considered exogenous population increases to set the growth rate. In 1957 Solow went back and incorporated technological changes into the model, making the point that while an economy has limited resources when it comes to labor and capital, progression in technology can lead to boundless growth and technology and education go hand in hand. The theory itself states that the relationship between labor and capital determines the output, but the level of labor is heavily influenced by the technology.

Solow Model

The Solow model itself is based around basic neoclassical assumptions and looks into the effects those assumptions have on growth. Using the four key assumptions of:

(1) there are constant returns to scale

(2) the market is always perfectly competitive
(3) complete information is available
(4) there are no externalities

Taking the basic Solow model, which is further explained below, one can insert education in the roll of human capital and use it to help model the growth education policy would bring. Starting with the consumer, labor (L_t) is supplied to the market at wage (w_t). At this point the consumer owns all the capital (K_t) and supplies it to the market at the rate (r_t). Because the consumer owns all the capital, they also receive all the profit (π_t), this is modeled in equation 1 below.

$$Y_t = r_t K_t + w_t L_t + \pi_t \quad (1)$$

With t being the value of the variable at that given point in time. In the Solow model the labor supply is exogenous and grows at the rate (g_t), and is modeled below in equation 2.

$$L_{t+1} = (1 + g_L)L_t \quad (2)$$

This growing labor supply captures the idea of an expanding population, which is key to understanding capital in this model as it is accumulated by the consumer. This accumulation is shown below with the deprecation rate of δ and I_t $representing\ gross\ investment$.

$$K_{t+1} = (1 - \delta)K_t + I_t \quad (3)$$

Before Solow wrote the general utility function for the consumer, he put in place two rules for the consumer:

(1) a fraction of the exogenous income (s) is saved by the consumer
(2) the consumer supplies all their labor and capital despite the price

Those rules allow for the equation to be rewritten in the following form:

$$K_{t+1} = (1 - \delta)K_t + sY_t \quad (4)$$

A general production function for the firm's technology can be found below. In function 5, capital augmenting technical progress is displayed (Simon Fraser University, 3).

$$Y = AF(K, L) \quad (5)$$

However, when looking at this model we want to measure how a nation's growth is attributed to its labor force growth, capital accumulation, and technical progress. In order to calculate those impacts, one needs to find the Solow residual. The first step in doing this is setting up a first-order Taylor series approximation:

$$Y_{t+1} - Y_t = \frac{\vartheta Y}{\vartheta K}(K_{t+1} - K_t) + \frac{\partial Y}{\partial L}(L_{t+1} - L_t) + \frac{\partial Y}{\partial A}(A_{t+1} - A_{t)} \quad (6)$$

Then dividing both sides by Y_t:

$$\frac{\Delta Y_t}{Y_t} = \frac{\vartheta Y}{\vartheta K}\frac{\Delta K_t}{Y_t} + \frac{\partial Y}{\partial L}\frac{\Delta L_t}{Y_t} + \frac{\partial Y}{\partial A}\frac{\Delta A_t}{Y_t} \quad (7)$$

Function 7 breaks down growth between the labor force, capital stock, and technology. One can further break down the growth for capital stock through the steps below:

$$\frac{\partial Y}{\partial K}\frac{\Delta K_t}{Y_t} = \frac{\partial Y}{\partial K}\frac{\Delta K_t}{K_t}\frac{K_t}{Y_t} \quad (8)$$

$$= \alpha_K \frac{\Delta K_t}{K_t} \quad (9)$$

$$= \alpha_{KgK} \quad (10)$$

The same steps can be taken for technology and labor, leaving one with the following results:

$$\frac{\partial Y}{\partial A}\frac{\Delta A_t}{Y_t} = \alpha_{AgA} \quad (11)$$

$$\frac{\partial Y}{\partial L}\frac{\Delta L_t}{Y_t} = (1 - \alpha_K)_{gL} \quad (12)$$

Then, one can substitute the results back in to the initial model to come up with the equation seen in 13 to define the Solow residual:

$$\alpha_{Ag\alpha} = g_y - \alpha_{KgK} - (1 - \alpha_K)_{gL} \quad (13)$$

This equation shows the estimate of the growth rate of the total factor productivity if there are observations of output, the labor force, and capital stock present (Simon Fraser University, 7). This method is often used to estimate Solow residuals for industrialized nations, as the residuals themselves show the impact of technology and capital accumulation on income growth. For the context of South Africa, the model must be further adopted to directly include education. In doing this one can show the impacts education investment will have on growing the middle class as well as the economy as a whole.

The model itself was the first model of its time to use an aggregate production function to measure growth, showing that an increase of inputs yields increasing returns. In this basic Solow model, differences in capital had yet to be defined but it was hypothesized that differences in capital (k) were the reason different countries have different levels of growth. Building off this basic model Paul Romer made the distinction between physical and human capital. Setting up his human capital function in the following format:

$$H(t) = L(t)G(E) \quad (14)$$

In the equation the amount of human capital is measured by the number of workers L(t) times the amount of human capital per worker G(E), with E being the average level of education for current workers in the labor force. When it comes to measuring the quality of education in South Africa, increasing quality is a necessary aspect to examine when it comes to increasing economic growth. This can be achieved through the savings rate. In a normal Solow model this rate measures the amount of income saved. However, in this context the rate can be used to measure

and display not just how many people are getting an education, but what they are getting out of said education. Just as when the savings rate increases, a higher rate of growth can be sustained, as the quality of education increases so will the rate of growth. This relationship can be seen modeled in *Figure 3.*

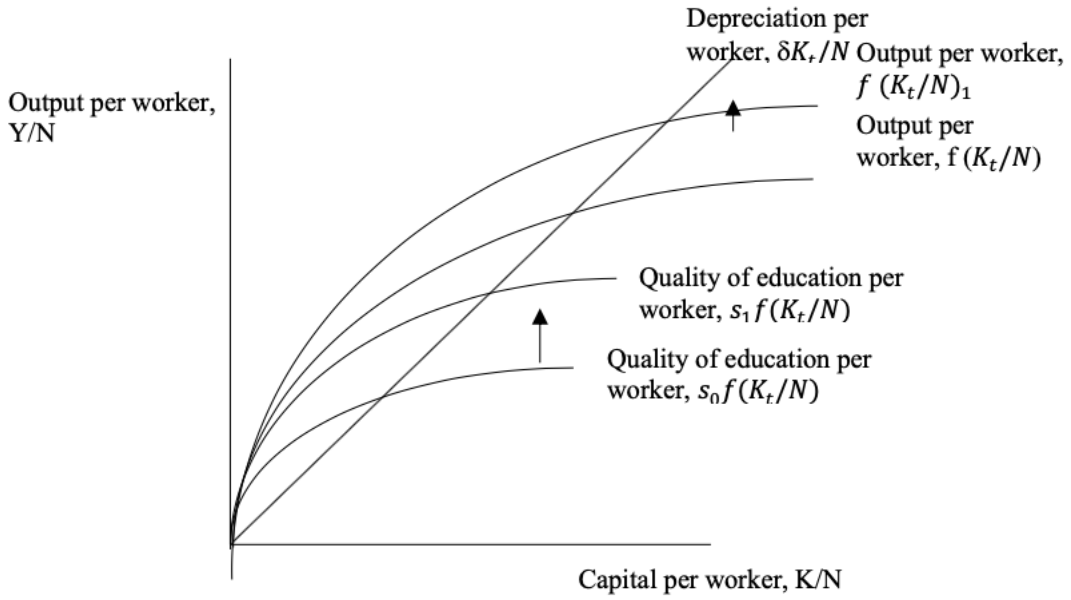


Figure 3: Effects of Increasing Education Quality and Human Capital

As seen above, through the savings rate model the quality of education a worker receives directly impacts their future output. By increasing the quality of education each worker receives this will increase the output per worker in the long run, allowing South Africa to increase worker productivity. This increase of worker skill and productivity would create more workers able to fill higher paying jobs increasing income and creating an economy with economic mobility allowing for class growth.

The model itself behaves similarly to the original Solow model, with capital being defined as:

$$k = \frac{K}{AH} = \frac{K}{ALG(E)} \tag{15}$$

Romer also added another important variable, living standards, modeled below in terms of Y/N with N being the total population.

$$\frac{Y(t)}{N(t)} = y * A(t)G(E)(\frac{L(t)}{N(t)}) \tag{16}$$

Equation 16 is key when looking at the impacts education has on a countries human capital and living standards. One can see that an increase in E will raise the human capital per person, moving the economy to a higher but parallel output to the original steady state path. While those effects are equivalent, in the long run, to an increase in L; this rise in human capital per person

shows that if education is productive a persons per-capita income will increase (Reed College, 58). This increase in output per-capita is due to a rise in human capital and is displayed in *Figure 3*. As displayed above an increase in human capital causes the production function to shift up, leading to an increase in output per worker. Both the increase in quality of education and the increase in human capital investment cause the output per worker to rise as skills increase. In the case of South Africa this increase is vital to the development of a middle class as the rise in skill level will create an environment more conducive to mobility.

Romer's addition to the Solow model shows that investment in human capital, specifically in education, would have a positive impact on a persons per-capita income. This also manages to prove that in the long run education investments are equal to, if not greater, than investments in labor. While the initial Solow model is key to understanding basic growth theory, it still left many aspects of economic growth unanswered.

Endogenous Growth Theory

Emerging in the late 1980s, building off of Romer's addition to the basic Solow model, Endogenous growth theory is based around the belief that long-run economic growth is determined by endogenous variables such as human capital, innovation, and investment in said capital, instead of the exogenous factors that were cited as the cause in previous theories. Formed to directly address the massive difference in wealth between nations that have proven both the neo-classical and classical models wrong over time, if growth was truly determined by exogenous factors outside of one's control those inequalities would have leveled out over time. When looking at the impacts of education in this new theory, there are two key implications to consider. One of the implications is that government policies can raise an economy's growth rate if they are focused on stimulating the market, and the second is that there are increasing returns to scale from investment in capital in the fields of education and health.

AK Model

Taking its roots from the basic Solow model the AK model is often considered to be one of the simplest ways to model Endogenous growth. This is modeled using a Cobb-Douglas type production function below.

$$Y = B * K^{\alpha} L^{1-\alpha} \tag{17}$$

This model shows constant returns to scale with K and L. While technology and population growth are exogenous factors, labor input is assumed to be one and B, total factor productivity, is taken at a given. This B factor is endogenously determined, allowing us to assume that:

$$B = AK^{1-\alpha} \tag{18}$$

In the AK model technological progress is modeled as a by-product of capital accumulation, putting the two previously given functions together:

$$Y = A * K * L^{1-\alpha} \tag{19}$$

As the model further develops, human capital becomes a separate variable as a more skilled labor force allows for more output to be produced than that of an unskilled labor force. This separation of human capital is important in the context of South Africa since the labor force has only truly been developing skills since the end of Apartheid. Factoring this to the model the formula would shift to:

$$Y_t = A_t * K_t^{\alpha} H_t^{1-\alpha} \tag{20}$$

This allows for growth to be determined by:

$$\frac{Y_t'}{Y_t} = \frac{A_t'}{A_t} + \alpha \frac{K_t'}{K_t} + (1-\alpha)\frac{H_t'}{H_t} \tag{21}$$

In this growth function K_t is physical capital and H_t is human capital. This allows for the assumption to be made that like physical capital, human capital depreciates. For example, if a person does not update and/or use their knowledge they have accumulated, it begins to decrease over time. Yet, this aspect of the model is critiqued as not all expenditures produce the same output (AK Model).

The AK model represents simultaneous accumulation of human and physical capital, allowing government policy to play a key role in growth possibilities. This model is another way to show the impact investing in human capital has on growth and development. In the end, we arrive at a similar conclusion as Romer's adjustments to the Solow growth model, that investing in education can lead to economic expansion.

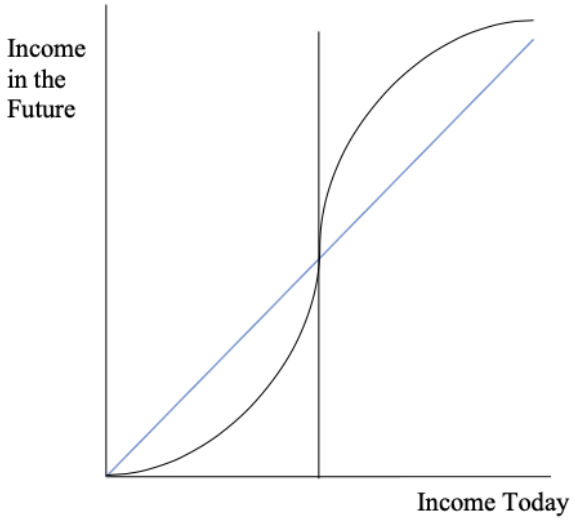
The Middle-Income Gap

In the case of South Africa, the upper class and lower class are seeing growth at much higher rates than the middle class with both classes nearly doubling in the period since apartheid, while the middle class remains stunted. This section will break down economic growth in South Africa by class, zooming in on the stunted growth seen in the case of the middle class and attempting to explain this classes' lack of growth through the model of the poverty trap. Additionally, this section will explain how this trap is occurring to the South African Middle class.

The Middle-Income Trap

When examining the middle class in South Africa, the poverty trap can be used as an explanation as to what happened in the class of the middle class in relation to education. The poverty trap model, which is displayed in *Figure 7* on the next page, shows an S shaped curve that depicts a trap for those who have incomes below a certain level. Once the curve reaches the inflection point and goes above the 45-degree line, the threshold level of income to escape the trap is reached. This curve shows the difficulty of escaping poverty and gives an explanation as to why social mobility is so hard. The left side of the diagonal line represents those who are stuck in poverty, where future income is less than current income, making it nearly impossible for future generations to switch classes. Those in the lower class lack the human capital to move up socio-economically and without the proper access to grow their capital, such as education, nothing will change. This has been what has been happening in the context of South Africa. Due

to the lack of investment in policies that would have promoted the expansion of human capital post-apartheid, there has been a lag in the development of the middle class; as much of the



population has been left stuck in poverty. The same thing can be said for those who fall into the South African middle class. Making the jump from middle class to upper middle class is incredibly hard due to the lacking education system in place.

Figure 4: The Middle-Income Gap

Education itself plays a non-trivial roll in this poverty-trap concept. Those who live in poverty are not necessarily able to make education a top investment priority in the early years of childhood. The income restraints in place make other needs such as food and shelter a much higher priority. This puts children from lower income households at an immediate disadvantage compared to those who had early access and were put in school from a young age. Families in lower income environments often need children to start working from a young age as well, further decreasing their time in school keeping them trapped in this cycle of poverty. By increasing access to more equitable levels of education through government policy, more of those lower income children will be able to get a head start with their education. Raising South Africa's overall levels of human capital, while increasing levels of class mobility.

II.B. Conclusion

In South Africa, action needs to be taken to pass further policies to help simulate the economic development of a multiracial middle class. Introducing investment policies centered around education could be transformative for this developing class. Investment in human capital has been proven as a key element necessary for sustaining economic growth over time. In focusing and investing in education as a specific element of human capital, not only will there be overall economic growth, but the limited class mobility currently present in the country may see its end.

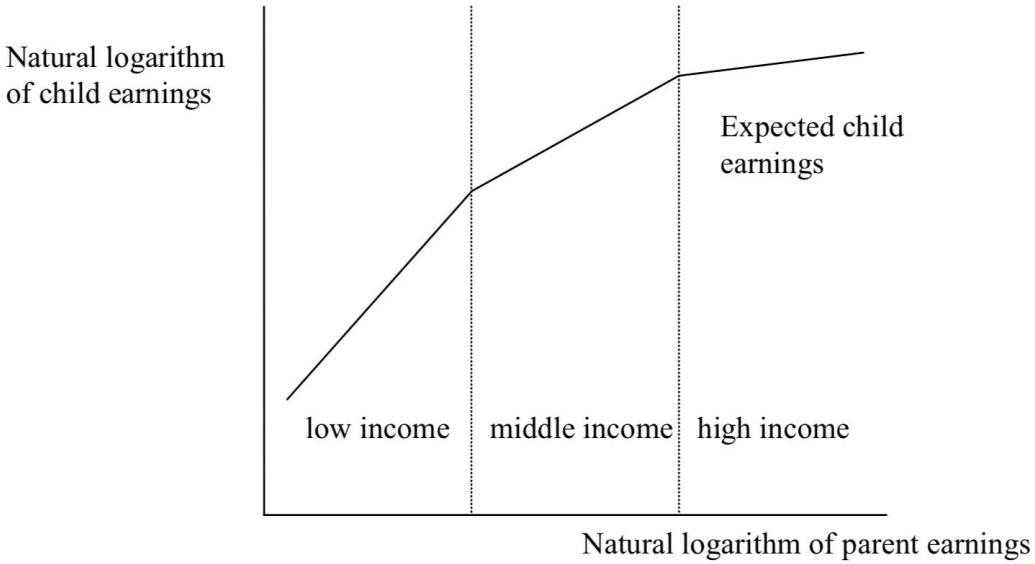


Figure 5: Intergenerational Earnings

SOURCE: Growe, N. (n.d.). Education and Economic Mobility. *The Urban Institute*, Harris, D. J. (2007). *The Classical Theory of Economic Growth* (dissertation).

In *Figure 5* one can view the intergenerational earnings for each class based on the earnings of their parents. Increasing investment in education was proven to increase per person earnings in Romer's addition to the Solow model, while also increasing living standards. Those points are key to promoting class mobility. In increasing earnings for one generation through investment in their education, incomes will rise not only for that generation but the ones to follow as well (Growe, 7). This would allow for economic expansion that is not currently possible due to the policies in place. In the next chapter current literature on the topic will be examined in further support of the hypothesis.

III. Literature Review

The development of a South African middle class has been a heavily researched and analyzed topic when looking at the country's growth. While it is clear the middle class itself has seen an increase in racial diversity over the past 25 years, it still remains clear the nation's high levels of economic inequality and incredibly limited class mobility have greatly hindered this developing class. Making it clear that more actions need to be taken to promote economic growth. At the same time, there has been literature written examining the current state of the South African education system, and how the schools have progressed since the 1990s. But, even with all the progress that has been made there is still a clear divide in education quality within schools across the nation, and more investment needs to be made to further even out the inequalities. While those issues are commonly identified in every piece of literature written about the individual topics, few offer up suggestions of how those inequalities can be truly evened out, and the connection between the two. This chapter will provide a background on both the current state of the South African Middle class and examine the education system through exploring current

literature before diving in and making the connection as to how investment in education could grow the middle class.

In Section b literature will be reviewed that explores the development of a middle class in South Africa Post-Apartheid. Explaining the two main policies that were enacted to promote the growth of a middle class and increase mobility, before further examining why they failed. In section c literature surrounding the South African education system will be discussed, going into the state of the overall system and the investments made in the last 25 years. Before talking about the high levels of inequality that are still seen across schools and the further action that needs to be taken. Section d will review literature that follows human capital investment, the impacts that this type of investment has on growth. Allowing the connection to be made between investment in human capital, in this case education, will help further development of the middle class by increasing mobility, helping support the hypothesis that an increase in educational investment will further develop the middle class.

III.A. Developing a Middle-Class Post-Apartheid

During the Apartheid era black South Africans were denied all economic rights, creating a society with no true classes. It wasn't until the 90s with the introduction of the 1998 Employment Equity Act which forced employers to implement plans that looked to achieve racial equality in the workplace. Of course, with the introduction of capitalism in 1994 came the rise of the first multiracial middle class to be seen in South Africa. The Black Economic Empowerment Act of 2003 was pasted to help promote growth and establish black businesses through the preferential procurement of government and parastatal contracts to 'BEE compliant' businesses. This emphasis on equity in ownership was put in place with the hopes of promoting the development of a strong middle class. Justin Visagie in his writing *The Development of the Middle Class in Post-Apartheid South Africa*[1] examines this development from 1994 to now.

Before one can examine and do any kind of analysis on the middle class, they first need to define what they consider to be middle class. Visagie examined and analyzed two different definitions of middle class. The first definition used was that of the affluent middle class, which was defined as individuals residing in households with an income R1,400 – R10,000 per month, the second definition took all the different per capita household incomes and found those that fell in-between the 50% and 150% marks of the median household income. Both of those definitions of middle class saw very little change in size from 1993 to 2008.

Past works also examined by Visagie contained analysis of this developing class. In 2010 S. Van der Berg ran a study where middle in South Africa was defined as households with a per capita household income in excess of R3,333. They find that 8.1% of the population in 1994 was middle class. This percentage jumped to 11.7% of the population by 2008 and that the share of the middle class who were black African rose from 12.3% to 36.4% between 1994 and 2008. Whiteford and van Seventer (2000) as well as Schlemmer (2005) also ran studies examining the growth of the African middle class in post-Apartheid South Africa and their findings concur with Van der Berg that the African middle class experienced significant growth post-1994. However, none of those studies set an upper boundary on middle class, and they failed to adjust for

[1] See Appendix AA

household size. Visagie used the two definitions of middle class to correct for those aspects missing from previous work.

Using data from 1993 Project for Statistics on Living Standards and Development (PSLSD) and the 2008 National Income Dynamics Survey (NIDS), Visagie ran his analysis to find that while 2.2 million individuals were added to the South African middle class between 1993 and 2008 the relative share of this class increased only from 19.2% in 1993 to 20.4% in 2008. Showing the class itself remained static. While the middle class remained static over time the upper class doubled and the number of people in poverty increased by 3.7 million. Visagie calls the squeeze of the South African middle class, as they are losing an increasing proportion of their share of total income. Blaming this in part to the Black Economic Empowerment act being too asymmetric, as the act itself is often criticized for being too narrowly focused and unable to achieve fundamental changes.

While the size of the class did not change, the racial make-up did. In 1993, whites outnumbered Africans in the middle class 2 to 1, in 2008 Africans now outnumbered whites 1.5 to 1. Though in terms of population black South African are still underrepresented, 2.7 million were added to the middle class. The upper class also showed a racial transformation with over 90% of the class being white in 1993, by 2008 the non-white share has risen to 45% with the black African share rising from 4.2% in 1993 to 20.3% in 2008. Visagie's findings clearly display the lack of middle-class growth despite seeing racial shift.

In *Neoliberalism and Economic Justice in South Africa: Revisiting the Debate on Economic Apartheid* Geoffrey E. Schneider further examined the development of a black middle class is post-apartheid South Africa. Finding that while the political environment has vastly improved there are still massive economic divides between racial lines. Schneider looked at the neoliberal theory installed by the ANC's Growth, Employment, and Redistribution (GEAR) program and argued that it was too narrowly focused on the economic criteria of GDP growth through allocative efficiency. The policy itself marginalized the real problems of inequality and poverty that were instilled by the Apartheid period. This, as stated by Schneider, overlooked the necessary redistributed strategy focusing to heavily on the virtues of a "free market" while the market in place was failing. Citing that the country had higher growth rates during the 50-70s, which was the middle of the Apartheid era. Making it clear the policy needs to change.

Bark Ö zler in his article *Not Separate, Not Equal: Poverty and Inequality in Post-apartheid South Africa*[2] further examines the failure of the GEAR program in South Africa, while discussing the failures of the first 1994 Reconstruction and Development Program (RDP) which had the focus of job creation through increasing in investment in public works programs such as infrastructure projects in housing, services and social security, and redistribution of wealth through land reform. Özler argues that the programs introduced have failed and further economic action needs to be taken in South Africa to insight economic growth. While those policies were aimed at increasing employment, during the period following the policies' introduction, unemployment rates grew from 17% to 24% in 1995 to 2000 with the number of discouraged

[2] See Appendix AB

workers increasing dramality. In part this was due to a high demand of skilled labor and an access demand of low skilled labor.

To further support his hypothesis Özler draws poverty lines by examining household consumption levels. Using data from two surveys, the October Household Survey (OHS) and the Income and Expenditure Survey (IES), combining it with a consumer price index which measures the different prices of goods Özler was able to estimate living costs developing a consumption aggregate which was used to draw poverty lines in South Africa. In doing this the upper and lower poverty bounds were found to be around R322 and R593. With this data Özler was able to find that there has been little change in poverty across racial lines. Despite the passing of those policies around 60% of the population lives in poverty according to his measurements. White and Asian South Africans saw no change in them from 1995 to 2000 in percentage of population that lives in poverty, while black South Africans saw a slight drop, coloureds saw the biggest change with 50% of the population living in poverty in 1995 to 35% in 2000. While it was found that household expenditures did increase on track with GDP, high rates of population growth and the low economic growth rate of the country led to a clear increase in inequality, with 2.3 million more people living in poverty.

Özler's analysis makes it clear that the policies passed failed to be conducive to economic growth or help with unemployment. In 2000, 60% of South Africans still lived in poverty according to the bounds drawn by Özler. Poverty has only worsened with the passing of those policies proving that new growth-based policies, with a different focus need to be passed.

George Sherer continues the analyzation of the clear economic inequality in South Africa in his literature *Intergroup Economic Inequality in South Africa: The Post-Apartheid Era.*[3] Sherer looks at the massive economic inequalities seen throughout the country, specifically the earnings gap that greatly hinders mobility, and examines how opportunity for nonwhites could be expanded. His theory is that this would best be accomplished by expanding employment opportunities and argues there are too main factors that need to be addressed when dealing with unemployment in South Africa. The first discussing educational attainment across races, during the apartheid era the Bantu Education Act was in place to suppress black African's access to education, however Sherer does not explore this factor in this paper and later roots all his agreements in the assumption that all groups in the labor market are equality prepared. The second factor becomes the focus of the paper, arguing that labor market discrimination could and is being used to exclude non-whites and/or limit their wages therefore limiting their opportunities once employed.

Sherer proceeds to detail the two possible leading explanations for possible wage and earnings differences across groups, making it clear the characteristics only differ ascriptively. The first model used to explain this occurrence is that individuals have Gary Beckers 1957 taste for discrimination. Let's say group B is being targeted and being discriminated against by group A, this means that group B's value is less than that of A. Group B would receive wages that are less than the marginal product of the good, while group A will receive a wage about the marginal product of the product. The revenues of group B entrepreneurs would also than less than that of group A due to the consumer-driven discrimination. The second possible theory for this wage

[3] See Appendix AC

gap across South Africans is found through labor-market segmentation. This is seen when members of group A establish labor or a general market dominance relative to group B with the purpose of limiting intergroup competition. Once this dominance has been established the market can be divided so that group A members receive the “good” jobs and products, while group B receives the “bad” jobs. In this scenario the distribution of wages and earnings corresponds to whether a job is considered “good” or “bad”, this dynamic establishes the distribution of income. J. B. Knight and M. D. McGrath (1977) argue that labor-market segmentation is the best theory available to describe the dynamic in the South African labor market.

Sherer uses data from the 1995 October Household Survey (OHS) collected by Statistics South Africa, looking at only households with positive earnings to run an OLS regression to examine the earnings gap between races. Key findings of this analysis were that the natural log of income. For whites and Asians was this figure was 0.572, implying that Asians earned 56 percent as much as whites. For coloureds and black Africans the corresponding figures were 1.413 and 1.525, implying that coloureds earned approximately 24 percent and African’s 22 percent of whites' earnings, a large difference.

Sherer’s work makes it clear there is a massive wage gap between races in South Africa but does little to suggest how to fix this issue. As discussed early in this section polices have been passed to attempt to achieve racial equity in the workplace but this has clearly not been enough. Sherer work is rooted in the assumption that end of apartheid implied dismantling of the discriminatory schooling policy. Which should have brought equal schooling opportunities across South Africa. However, that is not case.

III.B. The State of Education in South Africa

From 1948 to 1994 the South African education system was based around racism and prejudice. There were separate departments of education for different ethnic and racial groups, the legislation that governed those departments was incredibly biased and discriminatory. In *Education Across Generations in South Africa,* Duncan Thomas divides into the education during this time. Starting with the 1953 Bantu Education act which limited education expenditure to black schools through linking funding to their tax receipts. In 1989 white students received R4 of funding, Asian students received R3, coloureds received R2, for every R1 a black student received. Black South Africans born in the 1970s received the rough equivalent of an American 1930s education. This lacking education led to stunts when the middle class was first being developed post-apartheid, as those with little education seemed to be left in the cold. Thomas argues and shows by examining years of education compared to parents that education attainment is directly linked to that of parents. Though there has been slight mobility in all racial groups besides white South Africans, to further promote this mobility further action must be taken to help those break the cycle of education attainment.

In her article, *The implementation of inclusive education in South Africa after ten years of democracy*, Petra Engelbrecht disuses the shift from the non-inclusive education system of South Africa and the attempts made since to create a system that is equal for all South African children. Engelbrecht roots her argument in the belief that an inclusive education system is key to having a truly democracy and justice society, with economic equity and this remains a challenge for South Africa.

With the passing of the new Constitution of South Africa in 1996 came with it several education policies. The White Paper on Education and Training was passed in 1995, followed by the White Paper on an Integrated National Disability and the South African Schools Act in 1997 and 1996. Those pieces of legislation stressed that education is a basic human right and that all learners have an equal right to access. In 2001, White Paper 6: Special Needs Education, building an inclusive education and training system was released. This document acknowledged the failure of the post-apartheid education system and provided a framework for systemic change for the development of inclusive education. Citing the huge disparities that exist in former disadvantaged schools, especially those in rural areas, compared to those schools that were formally white. Despite the more equitable distribution of resources Engelbrecht cities that education quality still varies incredibly.

While some policy has been passed to attempt to equalize the formally segregated education system. Servaas van der Berg in his article *Apartheid's Enduring Legacy: Inequalities in Education*[4] examines the relationship between the inequalities still found throughout the South African education system through the relationship of race and quality of education. Putting forth the hypothesis that simply the shift in funding was not enough to improve matriculation rates. Van der Berg explains, like Engelbrecht, that the policies passed since the end of apartheid have been focused around monetarily evening out the system, as South Africa spends about 6% of its overall GDP on education which is much higher than most nations. Schools that were formally black, saw an increase 24R to 31R per student, and white schools saw a decrease in overall funding. With this the number of students that have made it to attempt to matriculate has gone from 43,000 in 1970, to 191,000 in 1990 and 473,000 students in 2005. However, university performance has not shifted, and the racial makeup of those who pass is far from even. Only 36.2% of black South Africans in the 26-30 range received a passing score while 70% of their white counter parts do. In van der Bergs eyes this is due to the massive variation in education quality.

Only 5% of black South Africans currently attend former white schools, this makes a clear difference in education quality. Black students only reach 78-86% of the education that is obtained by their white counterparts and their literacy scores are 50-63% of their whiter counterparts with their numeracy scores being just 34-47%. Van der Berg argues that a big factor in this is one's parents' level of education, as those who come from households with higher earnings have high chances of academic success. Using data from the South African department of education van der Berg ran several regressions looking at educational inputs and their corresponding outputs. With the matriculation pass rate being his dependent variable, van der Berg proved the biggest determining factor in a student's success was their race. With this van der Berg was able to prove that despite spending increases race still matters in the South African education system. Along with this schools' fees and resources were also a heavy influence and predictor of student success, going back to the importance of a student's socioeconomic status on their education.

Van der Berg proves his hypothesis that despite funding shifts since the end of apartheid matriculation rates have not improved at the pace they should have. To help fix those rates van der Berg makes several suggestions, one being a teacher redistribution program that will

[4] See Appendix AD

redistribute qualified teachers across all schools despite past. In this van der Berg states that improving education equity is critical to reducing the wage gap found between races.

III.C. Impact of Education on Middle-Class growth

When looking at the impact investing in education could have on the middle class there has been very little research done in the context of South Africa. In Désiré Vencatachellum and Michaud's *Human Capital Externalities in South Africa*,[5] the impacts education or human capital investment has on wages are discussed. By looking at the changes in the proportion educated in different cohorts, the authors were able to find the what the average level of human capitals impact is on labor market equilibrium and wages. Arguing that higher levels of education would increase worker productivity and therefore wages, the work aims to estimate the impact human capital has on overall wages.

To do this a model was developed to saying that wages depend on human capital and land market. Saying that as housing prices increase, so will the wages and demand for high skilled labor. Using wage and education data from 1993 South Africa Project for Statistics on Living Standards and Development (PSLSD), OLS and Probit model regression were run and corrected for bis using Heckmans two step corrections. It was found that while human capital levels within racial groups were not impacted, those levels were impacted across racial lines resulting in a bias against black South Africans. The results themselves prove that investing in education will help expand human capital, but policy needs to be directly passed with disadvantaged families in mind.

The topic of human capital growth in expanding economic growth is not just one hand inside South Africa. In *Models of Economic Growth and Development in the Context of Human Capital Investment- The Way forward for Africa* by Lansana Keita the impact those policies would have on the entire continent of Africa are discussed. Keita bases her hypothesis that this human capital development is a necessary condition for growth on the developed countries of New Zealand, Iceland, and Denmark. Arguing from a theorical standpoint that their investment in human capital through education produced highly educated populations that lead to the high GDPs and levels of growth those countries see today. Those nations with high investment in human capital, all have average populations with 12 plus years of school. While the average on the continent of Africa is less than 3 years. With this they all have much higher GDPS and per person income levels. While this article fails to take into account the different histories those nations have, it still bases a good argument of the importance and impacts human capital investment can have.

III.D. Conclusion

In this section literature surrounding the development of the South African middle class, the education system, and how an increase in human capital would benefit this developing class was review. It was shown that the development of the South African middle class has been slow, and the polices in place have not yielded the return hoped for. This led to the argument new polices need to be implemented to help this class expand. In terms of the South African education system, things are still far from where they need to be. Race is still the biggest determining factor

[5] See Appendix AE

of outcome, with familial status right behind. All helping prove the hypothesis that further developing the South African education system would help grow the developing middle class while promoting class mobility. Those studies reviewed were helpful in framing my empirical analysis in the next chapter.

IV. Methodology

After considering and examining the current literature surrounding the South African middle class, its stagnate growth and the lacking education system in the previous chapter, we can now move on to test this hypothesis using empirical data. Further showing that if South Africa passed polices that raised investment in education the growth rate of the middle class would see an increase due to the improvement in class mobility. The most appropriate method to test this is through different forms of the Ordinary Least Squares (OLS) regression model. To fully test this hypothesis one OLS regression model will be run with 3 different dependent or outcome variables using data collected from IPUMS International consisting of 32,283,726 observations from 1996, 2001, 2007, and 2011. Only observations from individuals 30 or older were used to ensure that those out of school were being measured.

Each of the models will include the following two independent variables. I include whether an individual lives and attends school in a rural setting and each pupil's attainment in school. Attainment will be further examined in each regression to see the direct impact being a black South African has on their progression in the education system. All the models will also control for whether the data was gathered from a school that is public or private. In *Figure 6* there is a table of descriptive statistics of every variable that will be used in the coming regressions.

VARIABLES	(1) Observations	(2) Mean	(3) Standard Deviation	(4) Min	(5) Max
Rural status	12,444,142	0.421	0.494	0	1
School Attainment	12,644,013	177.8	98.23	0	400
Total Income	11,822,984	17,879	91,827	0	2.458e+06
If Black South African	12,813,070	0.570	0.495	0	1
Income Distribution 1996	3,202,179	1.641	0.917	1	3
Income Distribution 2001	3,725,655	1.626	0.927	1	3
Income Distribution 2007	896,984	1.824	0.887	1	3
Income Distribution 2011	3,998,166	1.872	0.867	1	3
Middle Income	17,856,919	0.066	0.249	0	1
Below or at Poverty line	17,856,919	0.388	0.487	0	1

Figure 6: Descriptive Statistics

In the years 1996, 2001, 2007, and 2016 data was collected for every variable. Urban-rural status was a dummy created to determine if an individual lives in a rural or urban setting. Measuring 1 rural, and 0 for urban. Based on this data, with a mean of .421, it is clear over half of the observations were from urban settings. School Attainment was measured based on grade completion, from no schooling to the completion of university and can be seen detailed in *Figure 7* below.

Educational Attainment	(1) Frequency	(2) Percent
no schooling	1,741,908	13.78
some primary completed	2,323,991	18.38
primary (6 yrs) completed	2,229,795	17.64
lower secondary general completed	2,495,950	19.74
secondary, general track completed	2,008,408	15.88
post-secondary technical education	21,150	0.17
university completed	303,564	2.40

Figure 7: School Attainment Detailed

As one can see less than 16% of South Africans have completed secondary school, and less than 3% go on to complete university. In *Figure 8* on the next page the breakdown by race can been seen.

only 16% complete their secondary schooling. While 40% of white South Africans finished their secondary schooling, and 14% go on to finish their university degrees further highlighting the inequalities present in the education system.

Total income was measured based on each household's monthly income in the South African rand (ZAR). The "if black South African" variable is a dummy created to show as 1 if the individual is black, and 0 if another race to allow for further analysis of races impact. Income distribution took the total income and divided it up on a distribution curve for each year observations were measured; it was then divided into three sections. The middle of the two sections was used to create the variable "middle income." This created a dummy which shows 1 if the individual falls into the middle range for that year of incomes, and 0 if not. The poverty line was also developed from this total income variable. South Africa recognizes that the lower bound poverty line is R890 per month, with this information another dummy variable was created to measure how many individuals fell below this threshold. The poverty line variable shows 1 if a household's total income is equal to or less than R890 per month.

Educational Attainment	White	Black South African	Asian	coloured	Other
no schooling	24,328	949,396	12,060 20,111	63,692	1,724
some primary completed	54,953	1,476,549	24,525	147,249	1,941
primary (6 yrs) completed	61,897	1,256,567	32,579	184,740	2,398
lower secondary general completed	147,293	1,479,653	45,696	192,609	3,873
secondary, general track completed	308,754	1,077,280	72,741	132,154	4,794
post-secondary technical education	6,136	13,133	550	1,225	106
university completed	113,859	114,855	17,263	13,301	1,547
Total	802,447	7,287,063	225,525	839,931	18,720

Figure 8: Educational Attainment by Race

Those numbers show us that less than one percent of black South Africans finish university, and

The first dependent variable that will be examined will be income, allowing one to see the impact a household's total income has. Modeled in equation 22, this will allow for the impact income level has on the independent variables to be examined.

$$INCOME_\iota = \beta_0 + \beta_1 RURAL\ STATUS_\iota + \beta_2 ATTAINMENT_\iota \#\#black + \epsilon_\iota$$

(22)

The next dependent variable that will be tested is poverty rate. In looking at impacts of the percent of the population that lives below the line of poverty, different class levels can be examined and measured to find and show that those in poverty are more likely to see holes in their education. For the purposes of this analysis the poverty line will be defined as households with a total income at or below R890 a month. This regression model is displayed in equation 23 below.

$$POVERTY\ RATE_\iota = \beta_0 + \beta_1 RURAL\ STATUS_\iota + \beta_2 ATTAINMENT_\iota \#\#black + \epsilon_\iota$$

(23)

The final model that will be tested will be estimated with the dependent variable as middle income. To create this category, total income was taken and distributed into three categories with the middle one or "two" being labeled as middle income for each year observations were collected. To see the relationship between those in the middle-income boundaries and those in poverty, those in the 3rd category or those in the upper class will be dropped from this regression. This variable will be used to find where those who fall into the category of middle class in South Africa compare when it comes to measuring the independent variables. This can be seen modeled in equation 24 below.

$$MIDDLE\ INCOME_\iota = \beta_0 + \beta_1 RURAL\ STATUS_\iota + \beta_2 ATTAINMENT_\iota \#\#black + \epsilon_\iota$$

(24)

Through estimating multiple regressions, one can consider different entities of similar variables. This allows for a full analysis to be conducted, properly examining the impacts education-based growth policy would have on the growing South African middle class and how class mobility would be impacted.

After estimating the regressions listed tests for heteroskedasticity, to make sure the data is equally scattered, and multicollinearity, to ensure variables do not have high levels of correlation within each regression model. To test for heteroskedasticity a Breusch-Pagan test will be run, which assumes that all error terms are distributed normally and checks the variances of the error terms against the independent variables ensuring they are not dependent on them. To test for multicollinearity the inflation factor (VIF) will be used. If the VIF is above 5 for any of the variables, then multicollinearity is present, and variables may need to be dropped. Adjusting for any econometric issues encountered ensures that the results will be as reliable as feasible given the data. In the next chapter, the results will be presented from these regressions and the findings will be contextualized.

V. Results

In the previous chapter the methods and models behind analyzing the relation between economic growth and education, were outlined, and explained. In this coming chapter the three models will be estimated and used to support the hypothesis that the introduction of education-based policies would help grow the black middle class in South Africa by creating mobility. The three models estimated will all have the independent variables of urban-rural status and attainment. Each model was estimated with the different dependent variables of total income, poverty rate, and middle income. Those three regressions all had similar findings, showing that the current educational inequalities that exist in South Africa today make it so black South Africans struggle to participate in economic growth in turn hindering their economic mobility.

V.A. Regressions predicting Total Income

In the first regression run the independent variable of total income was examined. The baseline results of this regression can be seen in column 1 of *Figure 9*. Upon first look one can see that living in a rural area decreases one's total income by R6,864 a month.

VARIABLES	(1) Baseline Results	(2) Corrected for heteroskedasticity
Rural Status	-6,864***	-6,864***
	(53.49)	(37.45)
No schooling	3,364***	3,364***
	(161.8)	(50.94)
some primary completed	1,935***	1,935***
	(160.1)	(54.01)
primary (6 yrs) completed	5,022***	5,022***
	(156.0)	(57.88)
lower secondary general completed	15,522***	15,522***
	(155.2)	(88.30)
secondary, general track completed	59,032***	59,032***
	(157.9)	(175.3)
post-secondary technical education	203,668***	203,668***
	(971.0)	(3,313)
university completed	222,539***	222,539***
	(237.4)	(853.6)
1.black	2,262***	2,262***
	(160.8)	(67.97)
Educational Attainment if Black S.A.		
No schooling#1	1,624***	1,624***
	(209.6)	(85.80)
some primary completed#1	550.1***	550.1***
	(201.6)	(85.56)
primary (6 yrs) completed#1	-1,223***	-1,223***
	(200.5)	(88.56)
lower secondary general completed#1	-9,880***	-9,880***
	(197.5)	(112.7)
secondary, general track completed#1	-36,101***	-36,101***
	(204.1)	(205.9)
post-secondary technical education#1	-146,990***	-146,990***
	(1,235)	(3,622)
university completed#1	-62,432***	-62,432***
	(361.6)	(1,210)
Constant	4,074***	4,074***
	(128.6)	(46.00)
Observations	11,508,018	11,508,018
R-squared	0.142	0.142

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 9: Dependent Variable Total Income In terms of educational attainment, the general impact had on total income was positive, with each year of schooling increasing one's average earnings. While there is a drop from no schooling to the completion of primary, once primary school was completed students see an increase in their total income for each additional year of education completed. Going from those with a primary education earning R5,022 more a month, to those with a university education earning R222,539 more a month. However, for black South Africans each further education level completed has a negative impact on total income. A black South African with no schooling earns on average R1,624 more a month than their counter part. Yet, this only decreases as education levels increase. After completing secondary school R36,101 less is earned a month, and after completing university a black South African earns R62,432 less a month than their counter part. In *Figure 10*, this relationship can be seen modeled through a coefplot. Those findings relate back to and show the incredibly unequal access to equitable education across South Africa showing that massive quality differences exist between education offered to different racial groups.

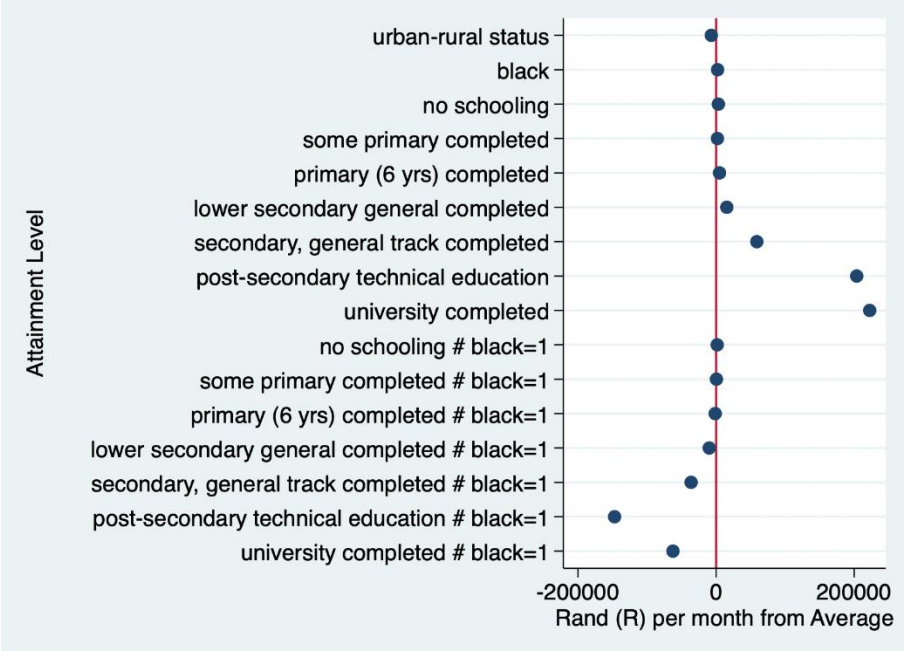


Figure 10: Coefplot Dependent Variable Total Income

When checking the baseline results for multicollinearity through the VIF test, all variables had a VIF of around one, showing there was no multicollinearity taking place. However, when running the Brush-Pagan test for heteroskedasticity the prob > chi 12 was 0.0, showing that there was heteroskedasticity present. To correct for the heteroskedasticity present the regression was run again using the robust standard errors method. Those results can be seen in column 2 of *Figure 9*. When comparing the two columns of results the coefficients do not change, but the standard errors become smaller for most values showing the room for error decreased with the correction.

V.B. Regression predicting living below the Poverty Line

For the second regression tested the independent variable run was the poverty line. The baseline results for this regression can be seen in *Figure 11*. Those results show that an individual is .0838 times more likely to live at the poverty line if they live in a rural community. Showing that access to resources is key when it comes to predicting one's future income. While the coefficients are small in magnitude, they are positive and negative, indicating a positive or negative relationship between those factors and the probability of living at or below the poverty line.

When looking at educational attainments impact on chances of an individual living in poverty, the average South African has a lower chance of living in poverty with each additional year of school completed. With the chances of an individual who completed only their lower secondary education having a .224% less likely chance of living at or below the poverty line, but once their secondary education is completed, they are .44 % less likely to live in poverty.

Once university is completed an individual is .597% less likely to live in poverty.

This is not the case for black South Africans. No matter how much schooling one completes their chances for living at or below the poverty line are always elevated. A black South African that receives no schooling has a .0643% chance of being more likely to live in poverty and that number only seems to rise with educational attainment. The completion of primary school leads to a .219% chance of being more likely to live in poverty, and the completion of secondary school comes with a .42% more likely chance of being in poverty. Once university is completed the odds of being in poverty do drop a little but a black South African still has a .283% more likely chance of living in poverty. *Figure 12*, on the next page, displays these findings visually through a coefplot. While those findings may be counter-intuitive, it may also indicate that there are stark difference in the lived educational experiences of black South Africans in ways that exacerbate inequities in income and other facets.

VARIABLES	(1) Baseline Results	(2) Corrected for Heteroskedasticity
Rural Status	0.0838***	0.0838***
	(0.000292)	(0.000293)
No Schooling	-0.160***	-0.160***
	(0.000837)	(0.000789)
some primary completed	-0.0502***	-0.0502***
	(0.000825)	(0.000752)
primary (6 yrs) completed	-0.174***	-0.174***
	(0.000804)	(0.000756)
lower secondary general completed	-0.224***	-0.224***
	(0.000799)	(0.000754)
secondary, general track completed	-0.440***	-0.440***
	(0.000815)	(0.000744)
post-secondary technical education	-0.580***	-0.580***
	(0.00547)	(0.00401)
university completed	-0.597***	-0.597***
	(0.00129)	(0.000964)
1.black	-0.219***	-0.219***
	(0.000825)	(0.000786)
Educational Attainment if Black S.A.		
no schooling#1	0.0643***	0.0643***
	(0.00111)	(0.00109)
some primary completed#1	0.0914***	0.0914***
	(0.00106)	(0.00102)
primary (6 yrs) completed#1	0.219***	0.219***
	(0.00105)	(0.00103)
lower secondary general completed#1	0.333***	0.333***
	(0.00104)	(0.00101)
secondary, general track completed#1	0.420***	0.420***
	(0.00107)	(0.00104)
post-secondary technical education#1	0.508***	0.508***
	(0.00696)	(0.00598)
university completed#1	0.283***	0.283***
	(0.00199)	(0.00163)
Observations	12,298,399	12,298,399
R-squared	0.067	0.067

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 11: Dependent Variable indicates whether someone lives at or below the Poverty Line

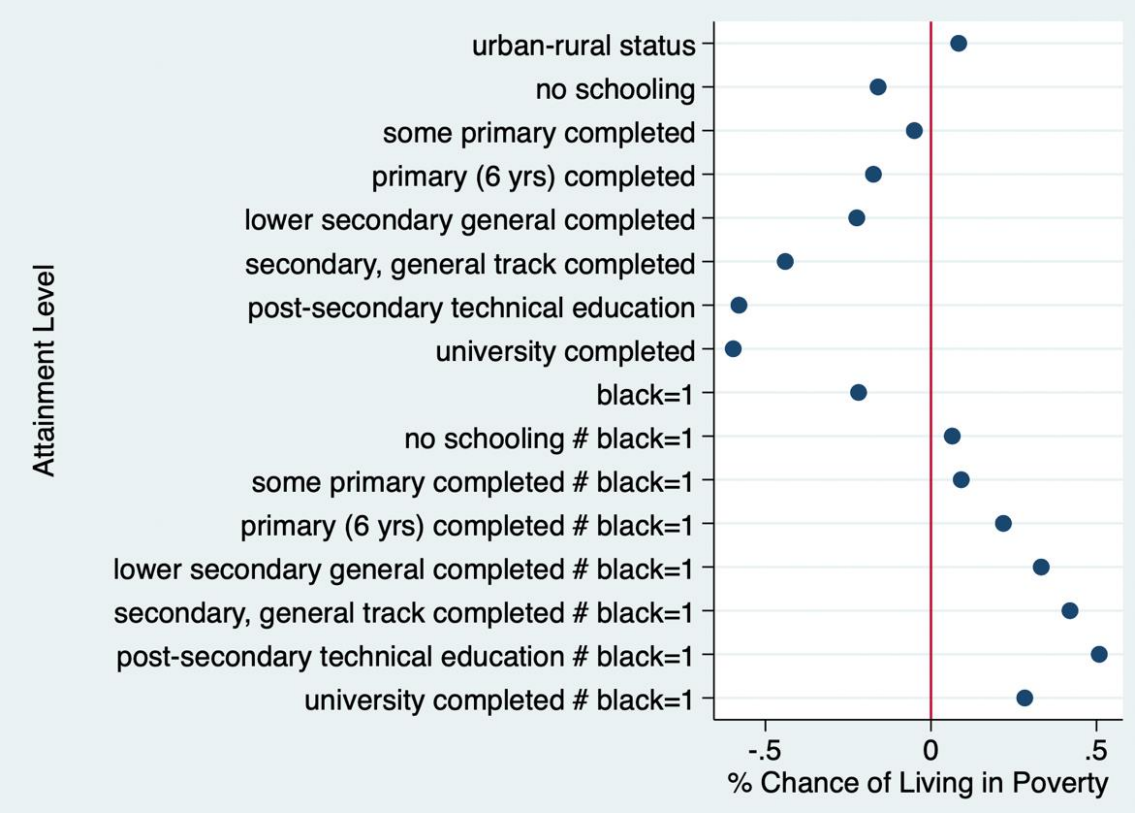


Figure 12: Coefplot Dependent Variable indicates whether someone lives at or below the Poverty Line

Like regression 1, heteroskedasticity was found and corrected for.[6] This correction can be viewed in column 2 of *Figure 11*. When corrected for the coefficients did not change, but the standard errors become smaller ensuring a smaller margin of error.

V.C. Regression predicting Middle Income

In the third regression run the independent variable was middle income. The baseline results for this regression can be seen in the first column of *Figure 13*. Urban-rural status had positive impact on if an individual was defined as middle income. With those in rural areas having a 2.95% higher chance of being middle income.

[6] VIF test was ran and no multicollinearity was found, Brush-Pagan test found prob>chi 12 was again 0.0

VARIABLES	(1) Baseline Results	(2) Corrected for Heteroskedasticity
Rural status	0.0231***	0.0231***
	(0.000225)	(0.000226)
Educational Attainment		
No Schooling	0.0323***	0.0323***
	(0.000606)	(0.000384)
some primary completed	0.0243***	0.0243***
	(0.000578)	(0.000339)
primary (6 yrs) completed	0.0293***	0.0293***
	(0.000587)	(0.000353)
lower secondary general completed	0.0154***	0.0154***
	(0.000595)	(0.000327)
secondary, general track completed	0.0182***	0.0182***
	(0.000701)	(0.000397)
post-secondary technical education	0.0951***	0.0951***
	(0.00908)	(0.00887)
university completed	0.0366***	0.0366***
	(0.00193)	(0.00134)
1.black	0.281***	0.281***
	(0.000562)	(0.000557)
Educational Attainment if Black S.A.		
no schooling#1	-0.133***	-0.133***
	(0.000824)	(0.000838)
some primary completed#1	-0.0841***	-0.0841***
	(0.000743)	(0.000732)
primary (6 yrs) completed#1	-0.168***	-0.168***
	(0.000767)	(0.000738)
lower secondary general completed#1	-0.228***	-0.228***
	(0.000762)	(0.000672)
secondary, general track completed#1	-0.253***	-0.253***
	(0.000888)	(0.000727)
post-secondary technical education#1	-0.289***	-0.289***
	(0.00995)	(0.00971)
university completed#1	-0.254***	-0.254***
	(0.00281)	(0.00226)
Observations	8,727,138	8,727,138
R-squared	0.079	0.079

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 13: Dependent Variable Middle Income

Educational attainment for the average South African increases the chances of said individuals' likelihood of being middle income. The coefficients are positive for all levels of educational attainment, showing a correlation between increasing school and higher likelihood of being middle income. With an individual completing primary school their chances of being middle income increases by .0293%. The completion of university leads to an individual having a .0366% higher chance of being middle income.

Yet once again this trend is not the case for black South Africans. Every level of educational attainment is followed with lower-than-average chance of being middle income. Along with this trend the more education a black South African receives the chances decrease of them fitting in the middle-income category. With no schooling a black South African has a .133% less likelihood chance of being middle income. This increases with the completion of secondary school to .253% less likely and with the completion of university a black South African has a .254% less likely chance of being middle income. This relationship can be seen modeled through a coefplot in *Figure 14* below.

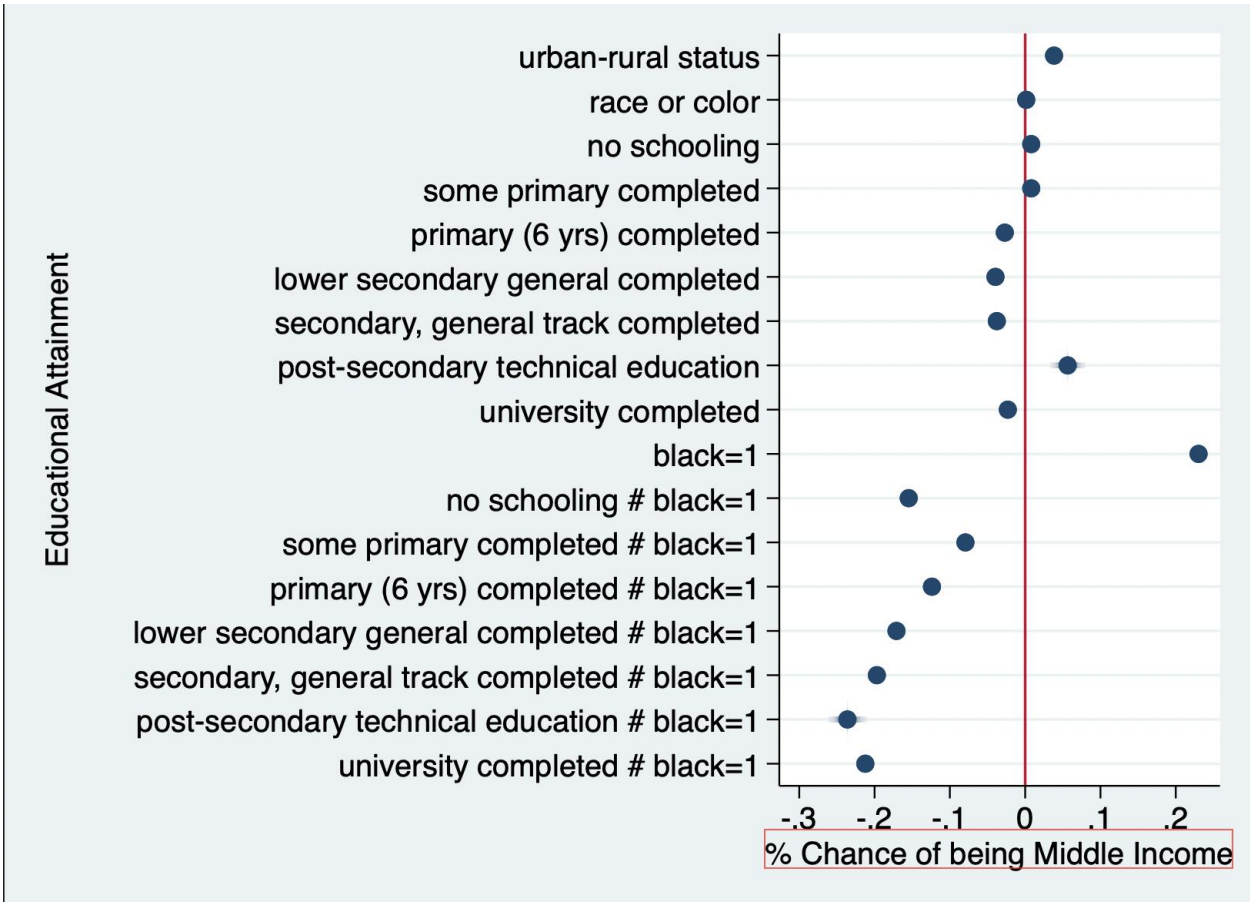


Figure 14: Coefplot Dependent Variable Middle Income

Like the past two regressions, heteroskedasticity was found and corrected for using robust

standard errors.[7] Those results can be found in column 2 of *Figure 13*.

V.D. Implications

The results from all three regressions highlight the general inequality and unequal schools found throughout South Africa. In regression 1 the results show that for the general South African population, as educational attainment increases so does total income. But when looking at black South Africans a clear negative relationship begins to appear. As schooling increases total income can be seen decreasing. Similar results were found in regressions 2 and 3 as well. In regression 2 it was found that while for the general population further education decreases the chances one will end up living in poverty, black South Africans on the other hand have a higher chance of living in poverty the more education that is obtained. In regression 3 the chances of earning a middle income are examined and it was found that again the general population has a higher chance of being labeled as middle income the more education obtained. But again, black South Africans had a very different result, finding that their chances of being middle income dropped even with a university degree.

Those results confirm that the economic disparity found throughout South Africa can be linked back to lacking and unequitable education systems. Proving the hypotheses that there are still massive differences in equity of education across South Africa. The results from this analysis further support the hypothesis that the educational system needs to be addressed in order to create economic growth. In creating an education system where everyone saw an equal benefit, mobility would become easier allowing for more advancing economic growth and class development.

VI. Conclusion

While South Africa has made some progress attempting to close the racial divides formed by Apartheid, there is still a long way to go. Through examining different existing literature, it was seen that the black middle class of South Africa is increasingly stagnant, while the education system of South Africa remains unequal. Using different growth theories, the connection between the human capital and economic development was made showing that South Africa could benefit from policies that invest in education. Through OLS regressions the inequity found in South African education due to race was further highlighted. Confirming the hypothesis that the large economic disparities found throughout South Africa are in part due to the unequitable education system.

This thesis has shown the policies currently in place to promote economic growth and educational equality are not attaining the results needed. As argued in this thesis further equity focused investment in education is necessary to help close the gaps in place. This could be done through policies that focus on providing extra, not just equal, funding to previously black schools to help increase access to tutors and lower-class sizes through the hiring of more teachers. This funding issue was touched upon in Petra Engelbrecht's *The implementation of inclusive education in South Africa after ten years of democracy*. Engelbrecht made it clear that just evening out funding was not enough to make up for the years of discrimination in the education

[7] VIF was ran and multicollinearity was not found, Brush-pagan test found the prob > chi 12 was again 0.0

system from apartheid policies. They argue that increasing funding to disadvantaged students and communities is a way to help close the gap in place.

Access to quality education in more rural communities needs to be addressed as well. This could be done by offering teacher incentives, such as pay increases for every year they are there, to go teach in those communities, as well as ensuring those schools have the necessary tools to properly educate their students. In his article *Apartheid's enduring legacy: Inequalities in education* Servaas van der Berg does touch on the need to redistribute teachers throughout South Africa. In his conclusion he mentions implementing a teacher redistribution program, and how this would be especially beneficial to rural schools which tend to lack qualified educators. While van der Berg does not give details of how this policy would operate, it is made clear that those efforts are necessary in closing the accessibly gap in South African education.

Another policy that could be examined is the implementation of government funded pre-school for every South African child. While this policy suggestion was not touched upon in any of the literature examined, this policy would allow kids without previous access to pre-school options to attend. Giving those students access will allow them to enter the traditional education years ahead of where they previously would have been, putting them in a more equal spot as their peers who would have had access. This will ensure that kids would get the chance to enter the education system at a younger age and on a more even playing field, hopefully helping decrease some of the inequality in the education of the next generation of South Africans.

While South Africa has made progress in many entities since the end of Apartheid, further action needs to be taken to help the stagnate middle class develop. For this class to further develop and for South Africa to address the current massive economic disparities, the unequitable education system needs to be addressed.

VII. References

Aditya, H. 2016, August 18. “Lewis model of Economic Development.” Economics Discussion. Retrieved December 4, 2021, from https://www.economicsdiscussion.net/agricultural-economics/lewis-model-of-economic-development/21590.

*“*AK Model.” (n.d.). https://www.lkouniv.ac.in/site/writereaddata/siteContent/202003261536151656sanjeev_eco_AK_Model.pdf.

Engelbrecht, P. 2006. “The implementation of inclusive education in South Africa after ten years of democracy.” *European Journal of Psychology of Education*, *21*(3), 253–264. https://doi.org/10.1007/bf03173414

Growe, N. n.d.. “Education and Economic Mobility.*” The Urban Institute.*

Harris, D. J. 2007. “The Classical Theory of Economic Growth (dissertation).”

Johansen, L. 1987. “A Classical Model of Economic Growth.” In *Collected Works of Leif Johansen* (pp. 219–235). essay, North-Holland.

Keita, L. 2016. "Models of Economic Growth and Development in the Context of Human Capital Investment- The Way forward for Africa." *Africa Development*, *41*(1), 23–48.

Michaud, P. C., & Vencatachellum, D. 2003. "Human capital externalities in South Africa." *Economic Development and Cultural Change*, *51*(3), 603–628. https://doi.org/10.1086/374802

Minnesota Population Center. Integrated Public Use Microdata Series, International: Version 7.2 [dataset]. Minneapolis, MN: IPUMS, 2019. https://doi.org/10.18128/D020.V7.2

Özler, B. 2007. "Not separate, not equal: Poverty and inequality in post-apartheid South Africa." *Economic Development and Cultural Change*, *55*(3), 487–529. https://doi.org/10.1086/511191

Padayachee, Vishnu. 2019. "Can Progressive Macroeconomic Policy Address Growth and Employment While Reducing Inequality in South Africa?." *The Economic and Labour Relations Review* 30, no. 1: 3–21.

Psacharopoulos, G. 2006. "The Value of Investment in Education: Theory, Evidence, and Policy." *Journal of Education Finance* , *32*(2), 113–136.

Reed College. n.d.. "Week 4: Human Capital in the Solow Model (pp. 57–65)." essay. https://www.reed.edu/economics/parker/EUBA/Doctoral/notes/Week4.pdf.

S, Nipun. 2017, January 13. "*Classical Theory of Economic Growth (With Diagram)."* Economics Discussion. https://www.economicsdiscussion.net/economic-growth/classical-theory-of-economic-growth-with-diagram/26276.

Schneider, G. 2003. "Neoliberalism and economic justice in South Africa: Revisiting the debate on economic apartheid." *Review of Social Economy*, *61*(1), 23–50. https://doi.org/10.1080/0034676032000050257

Sherer, G. 2000. "Intergroup Economic Inequality in South Africa: The Post-Apartheid

Era." *American Economic Review*, *90*(2), 317–321. https://doi.org/10.1257/aer.90.2.317

Simon Fraser University . n.d.. "Neoclassical Growth Theory (pp. 1–21)." essay. https://www.sfu.ca/~bkrauth/econ808/808_lec1.pdf.

Thomas, D. 1996. "Education Across Generations in South Africa." *The American Economic Review*, *86*(2), 330–334.

Van der Berg, S. 2007. "Apartheid's enduring legacy: Inequalities in education." *Journal of African Economies*, *16*(5), 849-880. doi:10.1093/jae/ejm017

Visagie, J. 2011, October. "*The Development of the Middle Class in Post-Apartheid South*

Africa." Micro-econometric Analysis of South African Data Conference.

VIII. Appendix

Appendix A: Literature Review Deep Dives

A: The Development of the Middle Class in Post-Apartheid South Africa

A1: Introduction

Justin Visagie in his article, *The Development of the Middle Class in Post-Apartheid South Africa,* starts the conversation about the role race plays in the developing class, and how the past 25 years since the transition into democracy have led to changes in racial composure in the different economic classes of South Africa. Putting forth the hypotheses that while the size of the middle class relative to the population has not seen an increase in the past 25 year, the racial make-up of the middle class has greatly shifted due to the passing of the Employment Equity Act and the Black Economic Empowerment Act. Visagie makes this claim by acknowledging previous studies done, many of which examined the development of the "occupational" class in South Africa under a neo-Marxist approach. However, many of those past studies were unable to classify those who were unemployed or out of the labor force due to their approach, Visagie makes it clear he hopes to include this previously missing information.

Visagie starts by giving the reader a background of the politics that are behind the South African middle class, explaining how during apartheid black South Africans were denied all economic rights. Not until the 1998 Employment Equity Act were employers even required to implement any kind of plans that looked to achieve racial equality. While evidence of upward mobility in occupations was found after implementation of this act, those trends were already in place prior. The Black Economic Empowerment Act of 2003 was passed to promote growth and establish black businesses through the preferential procurement of government contracts to 'BEE compliant' businesses yet faced much criticism for being too narrowly focused. Visagie makes the claim that there is a general census of middle-class growth following the passing of those two acts, using evidence from Van der Berg, Whiteford, van Seventer, and Schlemmer to back up his argument. However, none of the studies used to make this claim defined the upper boundary of the middle class. Van der Berg simply defined the middle class as households with an excess income of R3,333 in 2000 prices, and the other three all failed to adjust for household size in their research. Visagie sees those missing pieces and proceeds to define the middle class in two ways, the first being a middle class defined as households with income per capita of R1,400 to R10,000 per month and the second being households between 50% to 150% of the median per capita household income.

A2: Data and Methodology

Before going into the empirical analysis to back his claims, Visagie explains where he got his data. The 1993 data comes from the Project for Statistics on Living Standards (PSLSD) and Development, a national survey of South African individuals and households taken just nine months before South Africa's first democratic elections. With this data Visagie fails to mention how the surveys were given and if truly every household was measured or just a few were randomly selected. In 2008 the National Income Dynamics Survey (NIDS) provided a nationally

representative panel data set to give a picture of the state of South African individuals and households. This data is recognized by Visagie as just a snapshot of South African households, though meant to represent all of them. Visagie proceeds to compare the data from the two different years, 1993 and 2008, using empirical analysis. Examining the relation between the size of the different classes, forcing in on the middle class, while comparing it to the racial make-up and share of income held.

A3: Results

It is clear that a strong middle class is necessary for economic development, and according to the data provided by Visagie, the South African middle class grew by 2.2 million individuals from 1993 to 2008. When looking at the relative share, this increase is only marginal 19.2% of the total population in 1993 to 20.4% in 2008. Leaving the middle-class static during a period when the upper class doubled in size. During this period the poverty line decreased by 2.5%, but the number in poverty increased by 3.7 million. The racial makeup of those classes was also shifting during this time. In 1993, whites outnumbered black Africans in middle class 2 to, in 2008 black Africans outnumbered whites 1.5 to 1. This in part is due to the falling white middle class from heavy population loss. Yet, oddly enough Coloureds and Indians did not show significant changes but were also included in Black Economic Empowerment act. South Africa's upper class went from being 90% white in 1993, to being 45% non-white in 2008. Those shifting racial dynamics are shown in *Figure 15*.

		Lower class: (<R515)		Lower Class: (R515 - R1399)		Middle Class: (R1400 - R10000)		Upper Class: (>R10000)		Total	
		1993	2008	1993	2008	1993	2008	1993	2008	1993	2008
African	Count (000's)	21409 (96)	24504 (225)	6736 (77)	8777 (177)	2217 (47)	4947 (155)	19 (5)	211 (43)	30381 (84)	38440 (283)
	row %	70.5	63.7	22.2	22.8	7.3	12.9	0.1	0.5	100	100
	col %	93.8	92.7	74.2	79.1	28.9	50.2	4.2	20.3	75.9	79.4
White	Count (000's)	237 (17)	153 (29)	393 (23)	523 (61)	4175 (72)	3093 (151)	404 (23)	674 (87)	5209 (79)	4443 (186)
	row %	4.5	3.4	7.6	11.8	80.2	69.6	7.8	15.2	100	100
	col %	1.0	0.6	4.3	4.7	54.4	31.4	92.5	65.0	13.0	9.2
Coloured	Count (000's)	1062 (34)	1566 (69)	1570 (40)	1542 (68)	767 (28)	1159 (80)	8 (3)	43 (13)	3407 (58)	4309 (124)
	row %	31.2	36.3	46.1	35.8	22.5	26.9	0.2	1.0	100	100
	col %	4.6	5.9	17.3	13.9	10	11.7	1.9	4.2	8.5	8.9
Indian	Count (000's)	128 (10)	201 (42)	377 (18)	261 (39)	516 (28)	662 (68)	6 (2)	109 (38)	1027 (35)	1233 (97)
	row %	12.5	16.3	36.7	21.2	50.2	53.7	0.6	8.8	100	100
	col %	0.6	0.8	4.2	2.4	6.7	6.7	1.3	10.5	2.6	2.5
Total	Count (000's)	22835 (96)	26424 (234)	9077 (87)	11103 (200)	7675 (90)	9861 (237)	437 (23)	1037 (105)	40024 (45)	48425 (332)
	row %	57.1	54.6	22.7	22.9	19.2	20.4	1.1	2.1	100	100
	col %	100	100	100	100	100	100	100	100	100	100

Figure 15: Race and Class Status

SOURCE: Visagie pg 8

Another key aspect in Visagie's findings was the clear drop in class income over time, shown in *Figure 16*. While almost all the classes, except for the lower class consisting of less than R515, saw an increase in their classes size, only the upper class saw an increase in their overall income. Showing the gap between rich and the poor has only grown in South Africa following Apartheid.

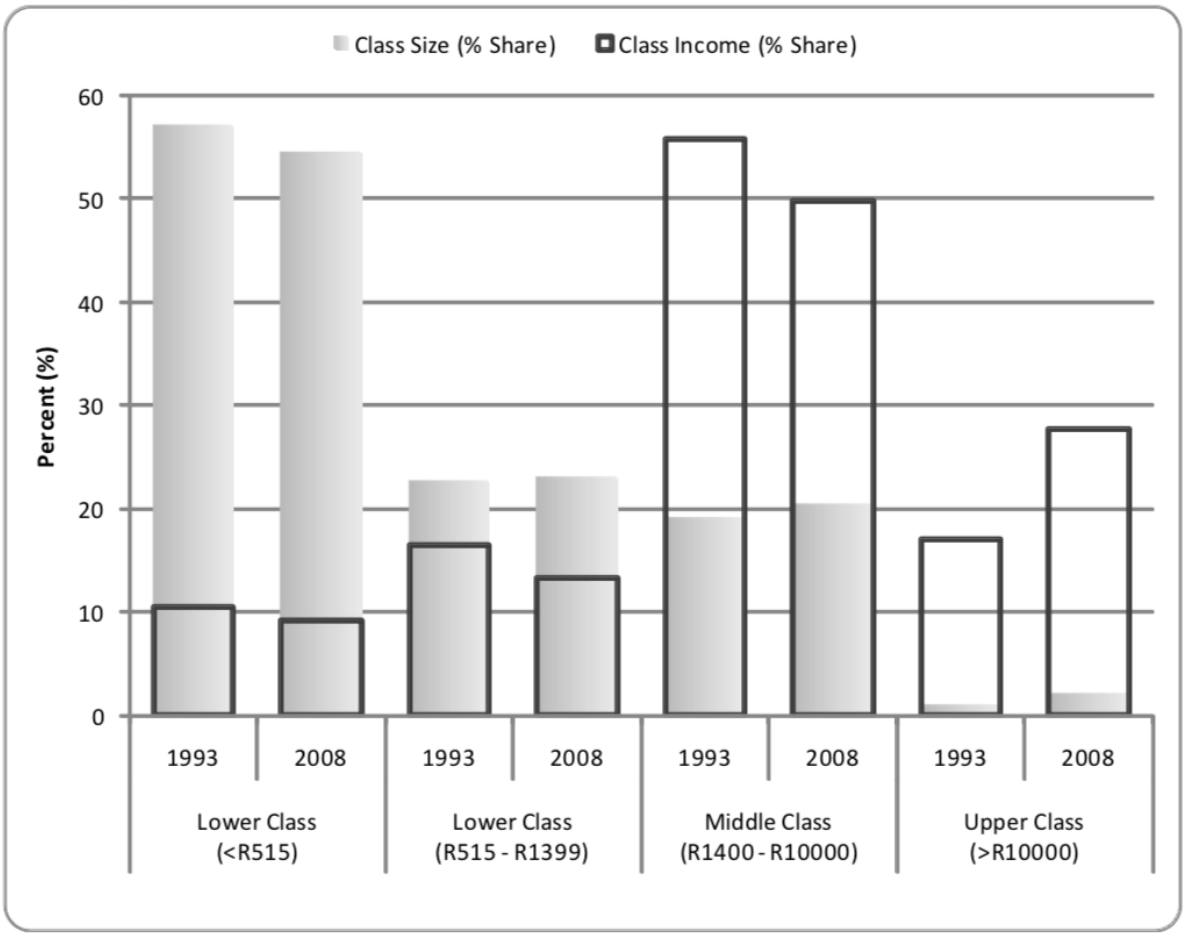


Figure 16: Class size and income share (1993 & 2008)

SOURCE: Visagie pg 7

Overall Visagie did manage to prove his hypothesis; however, correlation does not always imply causation. Just because South Africa's economic classes became more racially diverse since the passing of the Employment Equity Act and the Black Economic Empowerment Act does not mean that those two acts caused it, especially when the trends were already in place.

A4: Conclusion

In this article Visagie proves the racial dynamic of the South African middle class has shifted since the end of the Apartheid era, laying down the root for what one day will hopefully be a strong middle class. However, in proving this racial shift, many underlying issues within this developing class were uprooted. Through his analysis Visagie's clearly showed the classes growth has been slowed, and points to the growing inequality found in the country as a factor. While he doesn't give suggestions to reverse this, Visagie's work makes it clear the slow growth of the middle class is an important issue that needs to be addressed.

Visagie's piece gives a strong background on the different economic classes in South Africa. Overall, the empirical analysis was done as well as it could be, since there were a bunch of missing factors in the data. It would have been interesting to examine the trends that happened over the 25-year period instead of just the data from the beginning and compare it to the ending points, but that is something I can take and add to my own research.

B: Not Separate, Not Equal: Poverty and Inequality in Post-Apartheid South Africa

B1: Introduction

In his article *Not Separate, Not Equal: Poverty and Inequality in Post-Apartheid South Africa,* Berk Özler begins by stating the post-apartheid economic conditions in South Africa. How, in 1994, at end of apartheid the poverty line was R322 and 58% of all south Africans below this line. This percentage rose to 68% of South Africans by 1995. The Gini coefficient was .56, making South Africa one of the most unequal countries in the world. At the end of Apartheid, unemployment was around 30-40% and has only increase since then making it one of highest in the world. In the more rural areas unemployment was estimated to be close to 75%. Özler makes its it clear that economic action needed to be taken in South Africa, before he details the two policies that were put in place by the ANC. The Reconstruction and Development Program (RDP) was put in place in 1994 with the goals of job creation through public works programs, redistribution via land reform, and major infrastructure projects in housing, services, and social security. This program was immediately seen to be lacking and the second program, the Growth, Employment, and Redistribution (GEAR) was put in place just two years later. GEAR took a different approach to reclaim the economy aiming to increase growth and stimulate job creation through macroeconomic policy anti-inflationary policies, "including fiscal restraint, continued tight monetary policies and wage restraint". This program had high expectations and was supposed to increase GDP by 2.8-4% while reducing deficit by 3%, while prices were relatively stable, so was education spending. GDP grew by .6% the first year, but household expenditures grew by less than 1%.

Özler makes the argument that GEAR failed, citing that from the period of 1994-2000 the narrow unemployment rate grew from 17% to 24%. While the broad rate, which includes discouraged workers, increased from 29-38%. There was a high demand for highly skilled labor, but there was an excess of low skilled workers which caused poverty rates to increase. In Kwazulu-Natal those rates increased from 27% to 43% between 1993 and 1998. In this article Özler does two things to further prove this, he first examines consumption aggregates in the years 1995 and 2000 to compare and then uses monthly consumer price surveys conducted by Statistics South Africa

(STATS SA) to constructed upper and lower poverty lines before using the "cost-of-basic-needs" approach to examine poverty rates in South Africa.

B2: Data and Methodology

Özler uses data from two different surveys, each conducted by STATS SA, with data collected in 1995 and 2000. The first one is the first October Household Survey (OHS), which is taken annually, and the second one is the Income and Expenditure Survey (IES), which is held every five years. Each survey analyzes 30,000 households and covers all 14 metropolitan areas, 39 urban areas throughout South Africa's 9 provinces. By combining this data with the consumer price survey which collects data using a price index to measure the costs of different goods and services Özler was able to develop a consumption aggregate around living costs. The aggregate built by Özler contained estimated expenditures for food, beverages, cigarettes. Housing, compensation for domestic workers, personal care, household services, fuel, clothing, footwear, transportation, communication, education, reading matter, cost of licenses, rental charges, and insurance fees. For each expenditure Özler investigated all possible costs a household could have and factored them into the aggregate. With this Özler examined a person's basic needs and draws poverty lines based around living costs. After setting the upper and lower bounds, the poverty line for South Africa was stated to lay around R322 and R593 in 2000 prices. To factor for inflation provisional price indexes were used. The aggregate functions Özler wrote are displayed in *Figure 17*.

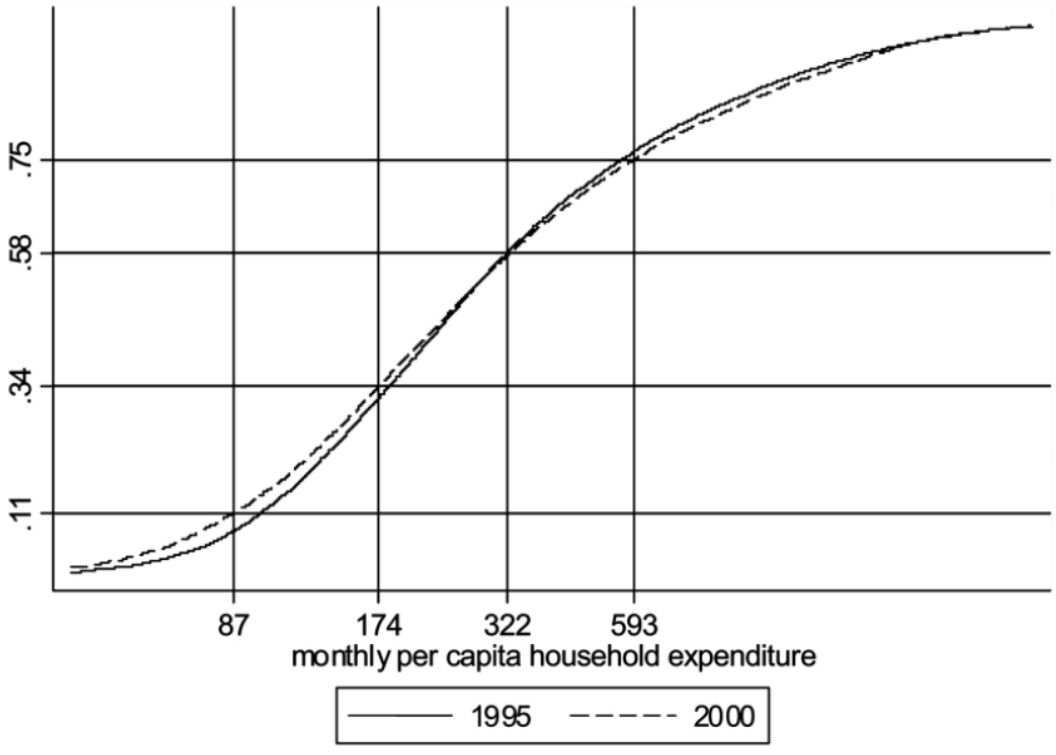


Figure 17: Aggregate Functions for Price Indexes

Özler pg 499

B3: Results

Upon examining the aggregate one can see that 58% of the South African population lived in poverty during both the years of 1995 and 2000 according to Özlers poverty lines. When

TABLE 1
CHANGES IN POVERTY BY RACIAL GROUP

	Lower-Bound Poverty Line (R322)	
	1995	2000
South Africa:		
Headcount index	.58 (.01)	.58 (.01)
Poverty gap*	.27 (.01)	.29 (.01)
Squared poverty gap*	.16 (.00)	.17 (.00)
Mean expenditure	534 (10.5)	547 (11.0)
Africans:		
Headcount index	.68 (.01)	.67 (.01)
Poverty gap*	.32 (.00)	.34 (.00)
Squared poverty gap*	.19 (.00)	.21 (.00)
Mean expenditure*	341 (6.8)	357 (5.9)
Coloureds:		
Headcount index*	.50 (.02)	.35 (.02)
Poverty gap*	.19 (.01)	.13 (.01)
Squared poverty gap*	.10 (.01)	.07 (.00)
Mean expenditure*	474 (15.9)	659 (23.6)
Indians/Asians:		
Headcount index	.08 (.01)	.07 (.02)
Poverty gap	.02 (.00)	.02 (.01)
Squared poverty gap	.01 (.00)	.01 (.00)
Mean expenditure	1,108 (66.6)	1,146 (49.7)
Whites:		
Headcount index	.01 (.00)	.01 (.01)
Poverty gap	.00 (.00)	.00 (.00)
Squared poverty gap	.00 (.00)	.00 (.00)
Mean expenditure*	1,989 (39.0)	2,211 (51.7)

Note. All figures are based on monthly per capita household expenditures in 2000 South African rands. All figures have been weighted using person weights (household weight × household size). SE (in parentheses) are corrected for complex survey design.
* The difference between 1995 and 2000 is statistically significant at the 90% level.

looking at the differences across racial lines almost no white South Africans live in poverty while more than two-thirds of black South Africans did in 1995, and over 40% did in 2000. As seen in *Figure 18*, between 1995 and 2000 white and Asian South Africans saw no change, but coloureds saw 50% of their population in poverty in 1995, drop to 35% in 2000.

Figure 18: Changes in Poverty by Racial Group

SOURCE: Özler, 502

While it was found that the annual per capita growth rate of household expenditures between 1995 and 2000 was 0.5% making it on track with GDP. When taking into account population growth and low growth rate of the country it becomes clear why inequality increased over this time period. In 2000 one in three individuals lived on less than two US dollars per day, and there were 2.3 million more people in poverty than in 1995. Seen in the increase of the Gini coefficient

and through statistics it is clear that the programs introduced failed to create the growth needed in South Africa.

B4: Conclusion

In this article Özler makes it clear that the ANC passed policies to promote growth failed through the review of poverty rates. Despite the attempts made, 60% of South Africans lived in poverty according to the lines drawn. While Özlers analysis was thorough there were some elements missing that could have caused slight differences in the result. One being the data does not deal with actual quantities of goods purchased, only the costs of said good and what is estimated as necessary. In looking at goods purchased one could gain a fuller understanding of what is truly a necessity. The data itself also has some holes in its sampling. It does not account for home grown products, such as food grown in the garden or clothes made at home, which could have thrown off the true cost of living. All the data points collected were also from more urban areas, leading Özler to need to create estimations for the rural ones. Which could have resulted in over estimation, for this analysis it might have been easier to control for urban and rural settings.

Özlers research and findings directly ties into the hypothesis of this paper, proving that the current policies of the ANC have failed to grow the South African middle class, moving those in poverty out of it, at the rate needed. Those findings prove that the poverty has only worsened and the gap between the classes has only grown. Making it imperative that new policies with different focuses be introduced.

C: Intergroup Economic Inequality in South Africa: The Post-Apartheid Era

C1: Introduction

In *Intergroup Economic Inequality in South Africa: The Post-Apartheid Era,* by George Sherer, Sherer examines the lasting economic effects the Apartheid state left on the relationship between education and how this impacts the wages differences between different racial groups in South Africa. Asking the research question of: What is the most effective and effective way for the current South African government to expand opportunities for non-white South Africans? Sherer introduces his hypothesis that this expansion of opportunities would best be achieved by expanding employment opportunities. However, this is much easier said than done, to prove this there are two main issues that Sherer must disprove. One being that educational attainment must be equal across races, and the second being the need to disprove labor market discrimination based on race.

In addressing the first issue at hand, Sherer gives the historical context that during the Apartheid period the Bantu Education Act was in place to suppress access to education to everyone who was not white, today access to education is still far from being evenly distributed. When addressing the second concern, workplace discrimination, Sherer makes it clear it could be used to exclude non-whites or limit their wages limiting opportunities once employed. Sherer than lays out three scenarios he believes are imperative to understanding why opportunities are limited for non-whites. The first being that earnings differences could be the result entirely of premarket factors such as education differences, the second being that earnings differences could be the result of labor-market practices that limit one group's earnings relative to another’s and the

third earnings differences to be the result of a combination of premarket differentials and in-market discrimination. This article focuses on measuring losses to non-whites from labor-market discrimination, but Sherer does mention policy to address all three of those scenarios would include leveling funding and increasing access to educational access for historically disadvantage groups.

C2: Data and Methodology

In the theory section of Sherer's work, he explains he will be examining to groups, A and B, making the assumption are equally qualified with characteristics only differing ascriptively. There are two possible reasons for why if those two groups are equally qualified wage and earnings differ across races. The first being that individuals have Gary Becker's (1957) taste for discrimination. For example, if group B is being targeted for discrimination than their output is valued at less than group A and group B wages less than marginal product, group A members receive income that is correspondingly greater than marginal product. The second being labor-market segmentation, if group A members establish labor or product-market dominance relative to group B members in order to limit intergroup competition. Once market dominance is established markets can be divided up with group A members receiving the "good" jobs and product markets and group B members receiving the "bad", the distribution of wages and earnings corresponds to the distribution of jobs from "good" to "bad," then labor-market segmentation theories assert that group dynamics establish the distribution of income. J. B. Knight and M. D. McGrath (1977) argue that labor-market segmentation theories best described South African labor markets.

Sherer collected his data from the 1995 October Household Survey (OHS) collected by Statistics South Africa, who surveyed 32,000 households. However, Sherer chose to restrict the observations used in his analysis to those with a positive earning between 20-26 years old. Among the observations used 67% were black Africans, 14% were Coloureds, Asians made up of 4%, and 15% were white. Which is very close to the physical racial make-up of the nation as a whole. When looking at the years of school completed very few white and Asians completed less than 8 years of school, over 57% of whites completed 12 years of school. While Africans and Coloureds were relatively uniformly distributed through years of school. Sherer did not talk much about this aspect of his research, I wish he had gone more in-depth on this topic before going on to compare the mean earnings of those groups. When comparing the mean earnings of those groups, after looking at those who have completed 8 years or more the inequality immediately becomes apparent. Sherer then goes into how he constructed his regression, stating his independent variables were school attainment and labor force experience, and his dummy variables were included to account for marital status, union membership, and geographic location.

C3: Results

Sherer found a concave relationship between the dependent and independent variables for whites and a downward sloping convex relationship for Africans. For both Coloureds and Asians the relationship was convex with a positive slope. The results of this OLS regression are shown in *Figure 19.*

Variable	African	Coloured	Asian	White
Intercept	9.076	8.345	8.792	7.489
	(182.892)	(44.792)	(14.613)	(28.421)
School	−0.0190	0.00133	0.0172	0.256
	(−3.902)	(0.137)	(0.479)	(6.226)
$(School)^2$	0.00967	0.00923	0.00611	−0.00450
	(27.812)	(13.298)	(3.752)	(−2.811)
Experience	0.0356	0.0408	0.0459	0.0660
	(15.595)	(10.102)	(6.365)	(17.755)
$(Experience)^2$	−0.000419	−0.000538	−0.000617	−0.00116
	(−11.376)	(−7.662)	(−4.285)	(−14.877)
D(marital status)	0.147	0.195	0.209	0.305
	(9.519)	(6.719)	(3.563)	(10.229)
D(union)	−0.436	0.363	0.107	0.124
	(−32.233)	(13.535)	(2.384)	(5.323)
D(Western Cape)	−0.111	−0.330	−0.452	−0.0606
	(−2.854)	(−1.867)	(−0.787)	(−1.133)
D(Eastern Cape)	−0.297	−0.424	−0.289	−0.173
	(−11.145)	(2.374)	(−0.501)	(−2.958)
D(Northern Cape)	−0.120	−0.183	−0.176	−0.075
	(−8.268)	(−3.065)	(−0.862)	(−3.483)
D(Free State)	−0.551	−0.699	dropped	−0.142
	(−21.189)	(−3.782)		(−2.512)
D(Kwa-Zulu/Natal)	−0.0882	−0.0574	−0.2860	−0.0573
	(−3.580)	(−0.311)	(−0.504)	(−1.042)
D(North West)	−0.190	−0.289	−0.0739	−0.0144
	(−6.795)	(−1.521)	(−0.128)	(−0.233)
D(Guateng)	−0.0226	0.0469	0.00682	0.135
	(−0.855)	(0.259)	(0.012)	(2.616)
D(Mpumalanga)	−0.183	−0.0927	0.151	0.0130
	(−6.854)	(−0.472)	(0.263)	(0.277)
Adjusted R^2:	0.462	0.485	0.366	0.337
F statistic:	624.37	189.08	37.26	109.2
Number of observations:	10,189	2,793	818	2,979

Note: Numbers in parentheses are t statistics.

Figure 19: Coefficients of Model Income in South Africa

SOURCE: Sherer, 319

Sherer than uses the natural log to show the differences in earnings. The natural log of income for whites and Asians was 0.572, implying that Asians earned 56 percent as much as whites in 1995, for Coloureds and Africans it was 1.413 and 1.525, implying that Coloureds earned approximately 24 percent and African's 22 percent of whites' earnings in 1995. The entirety of the section where Sherer explained his findings was choppy, and hard to understand. But it is clear the income loss compared to whites has decreased since 1980, shown in *Figure 20.*

TABLE 3—DECOMPOSITION OF THE DIFFERENCE IN MEAN INCOME BETWEEN WHITES AND EACH OF THE THREE NONWHITE GROUPS, 1995

	Asian	
Row	(i)	(ii)
1) Observed difference (ln *y*)	0.572	
2) Percentage (population group/white)	56	
3) %OWNCHR	−2.8	−0.51
4) %OWNCHR (natural log) (portion of wage differential due to differences in assets)	−0.0282	−0.00516
5) %ROR	−18.4	−15.6
6) %ROR (natural log) (portion of wage differential due to differences in returns to assets)	0.169	0.145

	Coloured		African	
Row	(i)	(ii)	(i)	(ii)
1	1.413		1.525	
2	24		22	
3	−9.5	0.16	−49.03	1.46
4	−0.091	0.0016	−0.399	0.0145
5	−25.86	−14.77	−22.0	−9.61
6	−0.230	−0.1378	−0.199	−0.0918

Notes: See text for explanation of columns (i) and (ii). The variable %OWNCHR captures the relative gain or loss in earnings attributable to human-capital differences; %ROR captures the relative loss or gain in earnings attributable to discrimination or nepotism.

Figure 20

SOURCE: Sherer 320

C4: Conclusion

The entirety of this paper is based around the assumption that everyone being surveyed had the same quality of education. While it is true everyone compared had the same level of education, the differences in quality of education across South Africa are drastic. Overall, Sherer made too many assumptions to truly prove his point, and his paper was not written in a way that made his point clear. In the end this article did show that when all things are assumed to be constant except for race, there is a wage gap found. Which does not in any way help prove Sherer's initial hypothesis that expanding opportunity is best done by expanding employment, if anything it makes it clear to the reader more action must be taken to level out the employment field. This discovery is an important one that has many far-reaching implications outside of the realm of employment. While Sherer's research fails to back his own hypothesis, it clearly backs the idea

that investment must be made in other fields, such as education, to truly even out and expand opportunities for non-white South Africans.

D: Apartheid's Enduring Legacy: Inequalities in Education

D1: Introduction

Servaas Van der Berg, in his article *Apartheid's Enduring Legacy: Inequalities in Education,* examines the relationship between race and quality of education found throughout South Africa. Published in 2007 in the *Journal of African Economic*s, Van der Berg put forth the hypothesis that despite the massive shift in resource allocation in education toward formally black schools since the end of the Apartheid era, matriculation rates did not improve.

Since 1994 attempts to reunify education in South African have been centered around spending and focused on equaling out monetary differences in schools, Van der Berg explains in the opening of his work. Over the years schools that were formally black saw a par increase in 24 to 31 R per student, while formally white schools saw a decrease in overall funding. While South Africa spends over 6% of its GDP on education, an incredibility above average amount for any nation, Van der Berg makes it clear under performance is still a major issue throughout the nation. While the number of students who make it to matriculate has increased, going from 43,000 in 1970, to 191,000 in 1990 and there being 347,000 students attempting the exam in 2005, university performance has not shifted at all and the racial make-up of those who pass is far from even. With 70% of white South Africans between the ages of 26-30 having achieved a passing metric score, while only 36.2% of black South Africans in the same age range achieved a passing score. In Van der Berg's eyes this gap comes down to the massive variation in education quality found throughout South African Schools.

Van der Berg makes it clear that it is common knowledge that South African schools have much lower performance rates when being compared to many of their African counter parts, despite having access to far greater resources. This massive variation in quality comes down to the formally black schools, Van der Berg argues that are still dealing the affects left directly by the Apartheid system. While some around 5.4% of black African students now attend a formally white school, 95% of black African pupils are still enrolled and attended formally black schools. Making this difference in quality of education clear, Van der Berg explains that black South African pupils only reach 78-86% of the years of education that are attained by their white South African counterparts. At the same they time achieved much lower results, with literacy scores being just 50–63% and their numeracy scores only 36–47% of their white counterparts. It's clear that many students are just moving up grade levels without truly mastering the material. In *Figure 21,* one can see how many students took the metric by race, and their results.

Table 4: *Matric-Aged Cohort and Matriculation Results in Public Schools by Race, 2003*

	Black	Coloured	Indian	White	Total	Black share (%)
Matric-aged cohort	819,700	76,400	21,800	66,900	984,800	83
Pass matric	229,871	27,988	15,673	45,883	323,057	71
Maths passes	96,949	10,424	9,971	29,387	148,582	65
Endorsements	42,310	5,523	8,988	24,000	82,265	51
Higher grade maths passes	9,669	1,494	3,945	11,942	27,671	35
Higher grade maths D symbol (50%) or better	3,768	884	2,749	8,969	16,822	22
A-aggregate mark	833	405	1,871	6,503	9,929	8

Figure 21

SOURCE: Servaas Van der Berg

While *Figure 21* displays detail on the student's different races, it fails to make the distinction of urban vs rural, a very important one in Van der Berg's eyes and many of the black South Africans that achieve passing scores are from urban areas. Van der Bergs argues that this is the case for several reasons, many of them being inequalities that are found outside of education. One major factor being parents' education level, this is shown in the 2001 data which found that if one's parents matriculated, the household had higher earnings, and this led to a higher chance of academic success for their children.

D2: Data and Methodology

To prove his theory, Van der Berg optioned to run several linear regressions to measure the statistical relationship between educational inputs and their corresponding outputs, using data from the South African department of education. While he did look into non-linear models, the fits were not improved. In using the matriculation pass rate from 1999 and 2000 as his dependent variable, Van der Berg can prove race is the biggest determining factor in educational outcomes for South African students. While data was only available for 7 of the 9 provinces, and the data only covers around half of the schools in those regions leaving many not represented Van der Berg still hopes to gauge a general understanding of the determinates of metric pass rates. His determinates, or independent variables, were the 1997 racial make-up of the school, 1997 was the closest available data to 1999 and 2000, pupil to teacher ratio, average teacher salary, and school fees. In using the pupil to teacher ratio and average teacher salary teacher resources were

measured, and school fees allows for the measure of resources per student. Van der Berg chose to measure the racial composures of the schools by inserting a dummy variable for each racial group.

D3: Results

After running his regressions Van der Berg was able to provide evidence to support his hypothesis that despite spending increases, race is still a major determinant of matriculation pass rates, those results can be seen in *Figure 22*.

Table 8: *Regressions of Matriculation Pass Rates by School in Six Provinces, 1999–2000 (t-values Shown Below Coefficients)*

Dependent variable: pass rate (average 1999 and 2000)	Regression 1: All schools	Regression 2: Mainly black schools	Regression 3: Other schools
School fees per pupil (R per annum)	0.037	0.105	0.029
	(13.90)**	(9.27)**	(14.27)**
Square of school fees per pupil	−0.000011	−0.0000051	−0.00000778
	(10.58)**	(4.86)**	(10.56)**
Pupil/teacher ratio	−0.129	−0.085	−0.346
	(2.93)**	(1.90)	(2.87)**
Average teacher salary (in thousands of Rand)	0.435	0.412	0.913
	(5.95)**	(4.43)**	(5.75)**
Mainly coloured school (dummy)	23.024		
	(11.66)**		
Mainly Indian school (dummy)	24.351		
	(9.05)**		
Mixed school (dummy)	17.872		
	(9.29)**		
Mainly white school (dummy)	25.706		
	(13.00)**		
Race unspecified (dummy)	26.554		
	(10.69)**		
Kwazulu-Natal (dummy)	5.521	4.528	3.228
	(4.86)**	(3.47)**	(0.82)
Free State (dummy)	−2.001	−2.004	5.404
	(1.29)	(1.14)	(1.37)
Northern Cape (dummy)	2.332	3.929	5.379
	(1.19)	(1.23)	(1.27)
Gauteng (dummy)	−1.263	−0.713	1.337
	(1.04)	(0.48)	(0.36)
Western Cape (dummy)	7.056	3.630	12.108
	(3.65)**	(1.00)	(3.17)**
Constant	11.049	10.025	13.431
	(1.81)	(1.36)	(1.12)
N	2768	2106	662
R^2	0.59	0.12	0.48

Robust *t*-statistics in parentheses.
*Indicates 0.05 level of significance.
**Indicates 0.01 level of significance.

Figure 22

After examining his results some of the key take ways from those regressions are that school fees and educational resources have heavily influenced on matriculation pass rates. Looking at the coefficient for school fees, one can see it is much larger in predominantly black schools showing

strong socioeconomic differentiation within those schools. Another key aspect to look at is the insignificance of the pupil/teacher ratio in dominantly black schools, Van der Berg voices that this could explain why the massive teacher resource shift following Apartheid had limited impact on improving overall performance on the metric. Looking at the R-squared of regression 2, of 0.12, this shows the large variation of pass rates in dominantly black schools, displaying again the vast differences in quality of education. Van der Berg also points out the success seen in regression one but makes a point to state that it is superficial, arguing that race composition blurred the effects of the other explanatory variables.

D4: Conclusion

Through his analysis, Van der Berg managed to prove his hypothesis, that even though resources have been redistributed more evenly throughout formally black schools, matriculation rates have not improved at the pace they should have. In order to help remedy this issue Van der Berg suggests a teacher redistribution program to help distribute qualified teachers more evenly around the nation, this would especially benefit more rural schools that tend to lack qualified educators. Van der Berg also states that improving black education is critical to reducing the racial earning gap, and government focus needs to turn toward improving education quality not just redistributing resources.

While Van der Berg managed to provide a fairly thorough analysis to back his theory, there are still several provinces of data missing, along with half the schools in the provinces that were surveyed. While those missing data points most likely would not heavily affect the results, they still leave the question of what the results would have looked like if they had been included. It is key that Van der Berg gave some suggestions as to what policy he thinks should be implemented to close this gap and voices the importance of closing the education gap in helping to address the high levels of economic inequality found throughout the country. As this is a key aspect of the argument of this paper, it will be able to further Van der Bergs ending thoughts while developing other aspects.

E: Human Capital Externalities in South Africa

E1: Introduction

In Désiré Vencatachellums' *Human Capital Externalities in South Africa* the impacts the Bantu education act had on wages and private returns are discussed, and how there are still large wage gaps between white and black South Africans along with prominent wage discrimination. The act itself heavily restricted access that non-whites had to education, greatly hindering the human capital development of generations. Looking at how changes in proportion of educated cohorts, Vencatachellum is able to look at what the average level of human capitals impact is on labor market equilibrium and wages. Vencatachellum hypothesizes this to be the case for two main reasons. One being that more educated workers can increase their less educated co-worker's productivity by increasing learning levels. The second being that higher levels of education often lead to faster adaptations of new technologies which can allow for productivity to grow. To further examine this, Vencatachellum aims to estimate the impact human capital has on overall wages. Looking to see if education of different racial groups has a direct impact.

E2: Data and Methodology

In order to test this, Vencatachellum set up a simple two sector economy to look at the correlation between the average human capital, wages, and the cost of living. In doing this the assumption is made that workers' demands for non-productive goods such as housing result as an increase in demand of labor. The model that was created says that wages depend on human capital and land market. For example, as more skilled workers arrive in a given area, the cost of housing and other goods will increase. As those goods increase in price so will wages. In the case of SA those externalities will be different for each race

To test this model, Vencatachellum uses employment and wage data from the 1993 South Africa Project for Statistics on Living Standards and Development (PSLSD). This source defines the labor market as those who are of the age of 15, not physical or mentally disabled, and not enrolled in school or retired. When looking at this data with no reference to education or human capital level it can be seen that black South Africans have the smallest earnings of all races. With black South Africans earning 626R per month, compared to their coloured and Indian counterparts who made 785R and 1,250R. All of them were far less than the white South Africans 2,706R a month.

MONTHLY WAGE IN RANDS

Gender(s)/Sector(s)	All Races	Black	White	Colored	Indian
Male:					
Urban	1,543	769	3,396	920	1,387
Rural	667	605	2,867	319	2,033
Urban and rural	1,185	677	3,359	856	1,400
Female:					
Urban	1,017	594	1,908	757	1,012
Rural	538	498	1,678	139	…
Urban and rural	854	547	1,892	695	1,017
Male and female:					
Rural	1,316	694	2,735	847	1,240
Urban	620	567	2,325	242	1,900
Rural and urban	1,051	626	2,706	785	1,250

NOTE.—Ellipsis (. . .) indicates that there were fewer than five individuals in the sample for this race-sector-gender category. Although the monthly wage is not presented in the table for this category, the monthly wages for members of the group do enter into the calculation for the combined urban and rural average monthly wage.

Figure 23

SOURCE: Pg 609

When it comes to Vencatachellum's data around years of education, the potential years of schooling are defined as the age of the person, minus five. Looking at *Figure 24*, one can see levels of education between the races are far from even. More than 40% of black South Africans

have less than 7 years of schooling under their belts, and only 16% have completed secondary school and received a certificate.

DISTRIBUTION OF WAGE-EARNERS' EDUCATION BY RACE

Percentage with Less Than the Following Number of Years of Schooling	All Races	Black	White	Colored	Indian
7 years	31	41	9	22	6
12 years	72	84	28	81	47
13 years (no postsecondary education)	89	94	65	95	86

Figure 24

SOURCE: pg 610

Just by looking at the data it is shown that wages and level of human capital have a positive correlation, the policies put in place during apartheid ensured this. But correlation does not always equal causation so further analysis must be done. With this data, Vencatachellum ran OLS and Probit regression models. While using Heckman's two step correction test to see if bias arose from the wage-earner status.

E3: Results

After running those regressions several things were discovered, one being that human capital by racial group does not impact wages within that racial group, but the impact of inter-race human capital on wage differs by race. When looking at black South Africans, it was found that their human capital has a positive impact on their white counterparts, as black South Africans become more educated white workers saw an increase in their overall productivity. But white South Africans human capital gains have a negative impact on their black counter parts

and cause the demand for black skilled labor to fall when there is a high percentage of white skilled labor.

ORDINARY LEAST SQUARES ESTIMATES OF THE WAGE EQUATION IN SOUTH AFRICA WITH HUMAN CAPITAL EXTERNALITIES (Dependent Variable: Log of Hourly Wages in Rands)

Explanatory Variables	All Races	Black	White	Colored	Indian[a]
Physical characteristics:					
Gender (= 1 if male)	.37**	.37**	.33**	.32**	.34**
	(15.28)	(12.12)	(7.05)	(4.22)	(3.03)
Race (= 1 if white)	1.80**				
	(12.53)				
Wage earner human capital:					
Number of years of primary education	.02+	.01	−.03	−.07**	−.03
	(1.93)	(1.55)	(1.42)	(2.62)	(.52)
Number of years of secondary education	.16**	.11**	.06+	.21**	.09
	(14.12)	(9.09)	(2.21)	(6.18)	(1.49)
Number of years of postsecondary education	.27**	.21**	.11**	.08	.34**
	(11.70)	(6.59)	(5.03)	(.98)	(6.20)
Number of years of potential labor market experience	.04**	.04**	.05**	.04**	.07**
	(10.43)	(7.67)	(7.62)	(3.77)	(4.32)
Number of years of potential labor market experience squared (divided by 100)	−.05**	−.05**	−.08**	−.05**	−.13**
	(7.32)	(5.97)	(5.52)	(2.88)	(3.85)
Aggregate human capital:					
Average number of years of schooling of blacks	.04**	.14**	.03**	.00	.01
	(7.83)	(12.91)	(3.76)	(.44)	(.90)
Average number of years of schooling of whites	−.04**	−.04**	.12**	.02	−.02
	(11.87)	(8.83)	(4.01)	(.97)	(1.62)
Average number of years of schooling of coloreds	.03**	.01	.01+	.26**	.04+
	(8.12)	(1.03)	(2.24)	(6.82)	(2.34)
Household assets:					
Wealth of the household	.44+	1.77**	.02	3.07**	1.79**
	(2.40)	(4.58)	(.09)	(4.05)	(2.59)
Number of years of primary education of household head	.02**	.02**	−.01	.04*	−.05
	(3.62)	(2.78)	(.27)	(2.26)	(1.50)
Number of years of secondary education of household head	.02+	.00	.01	.02	.11*
	(1.95)	(.36)	(.24)	(.64)	(2.71)
Number of years of postsecondary education of household head	−.002	.06	−.01	.17*	−.13*
	(.11)	(1.42)	(.49)	(2.15)	(2.11)
Housing prices in the cluster of residence (in 10,000 rands)	.027**	.014**	.014**	.008	.000
	(10.32)	(3.64)	(3.31)	(.62)	(.26)
Sectors:[b]					
Dummy (= 1 if the wage earner is in the manufacturing sector)	−.17**	−.33**	.01	.02	−.47**
	(5.30)	(8.06)	(.15)	(.21)	(2.76)
Dummy (= 1 if the wage earner is in the tertiary sector)	−.001	−.07+	.06	.22+	.05
	(.04)	(1.87)	(.87)	(1.94)	(.29)
Dummy (= 1 if the wage earner is in the professional sector)	.50**	.57**	.19**	.70**	.33+
	(14.15)	(12.29)	(3.43)	(5.87)	(1.85)
Dummy (=1 if the wage earner resides in an urban area)	.270**	.131**	.297**		
	(9.95)	(4.03)	(3.54)		
White cross effects:					
White × potential experience	.013				
	(1.57)				
White × number of years of potential labor market experience squared (divided by 100)	−.03+				
	(1.87)				
White × number of years of primary education	−.05*				
	(2.47)				

Figure 25

SOURCE: pg 614

E4: Conclusion

The results of Vencatachellum's analysis prove that policies aimed at investing and improving the South African education system would be of benefit to both black and whiter learners. However, this analysis shows there are still often factors that play a role in determining wages and who gets the job that do not stem from education. Vencatachellum suggests that while this study looks at secondary education, this issue could be better addressed through targeting primary schools. In doing this, children from disadvantaged families would have access to education earlier on, and discriminatory views could be untaught starting at an earlier age. This study helps prove the hypothesis that investing in education will help improve human capital development.