THE IMPACT OF EDUCATION ON EARNINGS IN THE MINING SECTOR.

SUBMITTED BY

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DECLARATION

I Caroline Chimhępó declare this research project is purely my own piece of work and has not been copied or taken from any other source. All constructs copied from other authors are not used without the acknowledgement of the source.

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…………………………………..on this          day of 2019.
(Signature)
DEDICATION

I dedicate this dissertation to my parents, Mr and Mrs Chimhepo, who have been my source of inspiration and taught me the value of hard work, with love. It is to them that I owe my very existence. And most of all to the God Almighty, it could not have been possible without him.
ACKNOWLEDGEMENTS

I would like to express my sincere and heartfelt gratitude to Bindura University of Science Education for according me an opportunity to study at their most prestigious institution. I am sincerely grateful to my Research supervisor, Mr. Chigusiwa who guided me through out the research period. He imparted his knowledge in me, inspired me and encouraged me to work very hard, without his help I would not have made it. I am very grateful to the whole department of Economics for they have been my point of contact through out the whole research project.

My gratitude goes on further to many writers whose work have been contributed to the knowledge body of my research and guided me in writing this research paper. It could not have been possible without their pioneering work.

My gratitude goes on further to my family, they have been so much supportive, encouraging and determined to see me through with the project. I really appreciate your love, care, and support throughout the course of the study. I can never forget all my friends and my classmates who helped me to complete my research, I will always be indebted to you all for the assistance you gave me.
ABSTRACT

The study endeavors to determine the relationship between the years of schooling and the rate of return, that is earnings in the mining sector. There are also other factors that affect individual earnings such as, gender, age, marital status and experience, these factors are included in our analysis so as to isolate the effect of education on earnings. A qualitative research methodology was employed and questionnaires were administered in different gold mining companies to obtain data on the variables of interest. The data was analysed with the use of tables and graphs to determine the relationship. The descriptive statistics results reveal that the mean monthly earnings of workers increase with more years of schooling. Literature also reveals that there is a positive relationship between education and earnings. The returns are low for those with lower levels of education and it is higher for those with higher levels of education like the university graduates. Thus the higher level of education, the higher the rate of return to the individual. Efforts should be made to improve the quality and investment in this level of education by encouraging private individuals to invest in and pay for higher education.
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CHAPTER ONE

INTRODUCTION

1.0 Introduction
Information on labour market outcomes including the earnings of educated groups in the Sub-Saharan Africa is limited. Government and individuals in this region invest heavily in education but little is known about how these investments generate rewards in the future (Glewwe P, 1990). Boesel and Fredland (2000), noted that one additional year of education adds approximately 10% to a person’s earnings in developed countries. However in developing countries no such statistics are available and the impact of education on earnings is not generally agreed to be always positive (Hause et al, 1972). The impact of different levels on earnings has been overlooked by many researchers especially in Zimbabwe. This study is going to investigate and analyze the extent to which investment in education affect individual earnings.

The issue of obtaining higher earnings has been an agenda for many people. The extent to which education raises earnings is loosely called the return to education. Generally, it is believed that the higher educated you are, the higher earnings you will get holding other things constant. Boesel and Fredland (2000) also noted that attaining higher education is an investment towards future earnings. However there can be some exceptional cases where earnings can be constant among individuals even if the levels of education are different. Individuals will quickly attribute such earnings to other factors such as skills, experience, training, age, gender etc. It should be noted that earning differentials might continue to be seen even if these other factors are held constant.

1.1 Background of the study
People fight to attain increased education for a better future because of economic hardship and poverty. While education has many non-market benefits, it is also valued for its role in helping people to become more productive and have higher earnings (Cohn and Geske,1990). The government is also concerned about the welfare of its people and hence has done a lot to make improvements in the welfare of its people.
The government through the ministry of education embarked on different policies in order to improve education in the country. Government expenditure on education has been quiet substantial over the years. Budget allocations to the sector were quite high since the government was on a drive to redress the imbalance that had been the norm during the colonial era. In a bid to improve the education, the government adopted the policy of education as a basic human right in 1980 and committed itself to universal and equal educational opportunity for all the people.

According to the Zimstats report 2017, In 2005, primary schools were compelled to have ECD classes in order to afford children aged 3 to 5 years the opportunity to access ECD education. In 2012, a total of 5 753 primary schools had been established in Zimbabwe with 5 625 of them offering ECD classes. In 2017 there were 6 123 primary schools of which 6 071 were offering ECD education. See Figure 1.1. It can be deduced that with the passage of time, all primary schools will meet the requirement of having ECD classes.

![Figure 1.1: Number of Primary Schools with ECD Classes by Year, 2012 to 2017](image)

The post-independence era saw the government increasing access to education by establishing new schools at all levels. Figure 1.2 below shows shows the trend in the number of schools between 2006 and 2017. Generally the number of schools has been increasing signifying the Government’s commitment to making secondary education accessible to all.
As at 2017, there 16 universities around the country and Table 1.1 shows a general increase in university enrolment between 1997 and 2017 which can be attributed to the establishment of new institutions and expansion of the existing ones. With males dominating in 1997, the gender gap has been narrowing across the years up to 2016. In 2017, the gender difference was now in favour of females surpassing males by a margin of 11 percent. However, analysis of enrolment within different areas of study show that females dominate in some faculties such as arts, education, social studies, social sciences, communication and information science, hospitality and tourism, management and health sciences. See also Tables in Appendix Table A.

**Table 1.1: University Enrolment by Sex, 1997 – 2017**

<table>
<thead>
<tr>
<th></th>
<th>Sex</th>
<th>Year 1997</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>13 489</td>
<td>12 741</td>
<td>19 192</td>
<td>20 735</td>
<td>22 505</td>
<td>22 811</td>
<td>26 486</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>5 796</td>
<td>6 330</td>
<td>8 836</td>
<td>10 640</td>
<td>12 598</td>
<td>12 795</td>
<td>14 512</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>19 285</td>
<td>19 071</td>
<td>28 028</td>
<td>31 375</td>
<td>35 103</td>
<td>35 606</td>
<td>40 998</td>
<td>46 712</td>
<td>53 665</td>
<td></td>
</tr>
</tbody>
</table>
Table 1.2 (continued): University Enrolment, 1997 – 2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>33 729</td>
<td>32 977</td>
<td>66 706</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>34 524</td>
<td>32 877</td>
<td>67 391</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>29 456</td>
<td>30 536</td>
<td>60 000</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>30 132</td>
<td>30 211</td>
<td>60 343</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>32 764</td>
<td>33 264</td>
<td>66 028</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>42 012</td>
<td>43 589</td>
<td>85 595</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>41 521</td>
<td>48 673</td>
<td>89 273</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>48 413</td>
<td>53 547</td>
<td>101 960</td>
<td></td>
</tr>
</tbody>
</table>

Source: Ministry of Higher and Tertiary Education, Science and Technology Development

The 2017 Inter-Censal Demographic Survey collected information on the highest level of education completed among the population aged 3 years and above. Out of the 11 million people aged 3 years and above, about 85 percent had completed either primary or secondary education. About 3 percent had completed short cycle tertiary education which includes certificates and diplomas. Slightly over 1 percent had completed a Bachelor’s degree while less than 1 percent had completed either a Master’s or a Doctoral qualification. See Table 1.3 below.

Table 1.3: Population Aged 3 Years and Above by Highest Level of Education Completed and Sex, 2017 ICDS

<table>
<thead>
<tr>
<th>Level</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Total Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-School</td>
<td>447 126</td>
<td>447 847</td>
<td>894 973</td>
<td>7.9</td>
</tr>
<tr>
<td>Primary</td>
<td>2 212 624</td>
<td>2 507 876</td>
<td>4 720 500</td>
<td>41.8</td>
</tr>
<tr>
<td>Secondary</td>
<td>2 364 246</td>
<td>2 506 353</td>
<td>4 870 599</td>
<td>43.1</td>
</tr>
<tr>
<td>Short-Cycle Tertiary</td>
<td>181 872</td>
<td>155 970</td>
<td>337 842</td>
<td>3.0</td>
</tr>
<tr>
<td>Bachelor's Programme</td>
<td>86 875</td>
<td>64 224</td>
<td>151 099</td>
<td>1.3</td>
</tr>
<tr>
<td>Master’s Programme</td>
<td>18 191</td>
<td>11 128</td>
<td>29 319</td>
<td>0.3</td>
</tr>
<tr>
<td>Doctoral Programme</td>
<td>1 185</td>
<td>660</td>
<td>1 845</td>
<td>0.0</td>
</tr>
<tr>
<td>None</td>
<td>128 644</td>
<td>1 35 056</td>
<td>263 700</td>
<td>2.3</td>
</tr>
<tr>
<td>Not Known</td>
<td>10 611</td>
<td>13 853</td>
<td>24 464</td>
<td>0.2</td>
</tr>
<tr>
<td>Total</td>
<td>5 451 374</td>
<td>5 842 967</td>
<td>11 294 341</td>
<td>100</td>
</tr>
</tbody>
</table>

Data collected from the 2014 Labour Force Survey showed that out of the population aged 15 years and above, 9.5 percent had completed tertiary education such as diplomas and degree programmes. A majority of the people in this age group had completed lower secondary education, i.e. Ordinary level. See Figure 1.3.
Figure 1.3: Highest level of Education Completed by Population Aged 15 Years and Above, 2014 LFS

The government encouraged the establishment and strengthening of skill based and community-based education programs which equip children with a wide range of knowledge, living skills and values required for success in life. In recent years, there has been a persistent drive for the computerized and networking of tertiary institutions through Educational Management Information System (EMIS). The country also moved towards a computer based higher education system promoting computer use and technology at all levels of education.

Zimbabwe is well endowed with over 40 mineral resources, which include gold, copper, nickel, coal, PGMs, diamond among others. Currently, mining accounts for more than 60 % of exports and contributes around 15 % to the Gross Domestic Product (GDP) making Zimbabwe a resource-driven economy (Segula, 2016). Mining has played a pivotal role in Zimbabwean economic history. It provided direct and indirect jobs and helped in advancing towards human development. Towns such as Zvishavane, Hwange, and Bindura were built because of mining (Mhembere, 2013). Furthermore, companies were formed to service the needs of the mining industry, providing the much-needed linkages for economic growth and development. Zimbabwe's minerals present the potential for economic stimulation to growth, which can lead to economic transformation and human development (Manyonde & Mandishara, 2015)

According to Economic Commission for Africa (2011), the mining sector must integrate into both national and regional economy to produce linkages. The emphases were on building
capacity on human capital especially on the knowledge intensive areas and the addressing of infrastructure bottlenecks to building strong linkages between sectors.

The transformation of the Zimbabwean economy requires a highly skilled and educated labour force. The country suffered one of the worse cases of brain drain. Professionals and industrial experts have fled the economic hardships and among other reason looking for “greener pastures” mainly in South Africa, Botswana, United Kingdom and the USA. Causes of human capital flight in Zimbabwe are related to the political environment with many suffering political persecutions (Chetsanga & Muchenje, 2003). There is a need for government to come up with strategies to train and manage to retain the skilled human capital because the country is losing its investment in education.

According to the study by (McKinsey Global Institute, 2013), 540 million people can be lifted out of poverty by 2030 if the resource-driven countries in the world match best performers in poverty alleviation. Figure 2.1 shows expected resources investment in developing countries and potential for poverty reduction if minerals resources are managed properly.

In 2012 the World Bank projected that Zimbabwe’s investment demands in the mining sector will be around $11 billion. The group said the sector will grow at a double digit rate between 2013 and 2017 compared to all other sectors which are anticipated to grow in single digits.

The group was very optimistic that the contribution of the mining and mineral exploration could increase, with well-targeted value addition and beneficiation programs, however, they indicated the need for the Government and the stakeholders to address the then prevailing policy conditions.

In 2016, the mining sector in Zimbabwe were heavily elected by exogenous factors. The revenues were declining. The average revenue generated by the mining sector since 2011 is $2 billion which declined to $1.8 billion in 2015. The industry testifies that the decline in revenues is due to low output and the subdued international commodities prices among other factors.

In Zimbabwe, mining companies provide basic social services for the miners such as education, health and creation. These services such as education help the people of the surrounding communities. Apart from the direct investments in education through setting up of schools,
mining companies support tertiary education through the provision of scholarships and setting up of specialist schools such as the school of mines in Bulawayo. (Rachel Majaya, 2017)

The Zimbabwe School of Mines in conjunction with Zimbabwe Miners’ Federation has recorded a total of 55 women in December 2017 who graduated with certificates after completing a training course in the fundamental principles in mining (the Chronicles 2017, Kiyapili Sibanda). This showed that both women and men have a huge role to play in the mining industry in order to uplift their livelihoods.

In 2018, Anglo-American Zimbabwe Companies Chairman’s fund in partnership with Unki Mines handed over teaching and research equipment worth US$292,000 to the university of Zimbabwe school of earth and Mineral sciences as part of the US$5 million social investment fund. This initiative was aimed at fostering quality educational infrastructure and equipping learning material to schools in rural and urban communities.

1.2 Problem statement
Zimbabwe experienced a severe brain drain during the 1998-2008 economic crisis. Data indicate that private returns to education significantly declined across all levels with the highest decline occurring among workers with tertiary education. This suggests that part of the human capital flight was due to dysfunctional labor markets. (Prudence Kwenda, Miracle Ntuli, 2014).

1.3 Objectives of the study
1. To analyze the impact of education on earnings in the mining sector.
2. To investigate other factors that can affect earnings.
3. To see if there is a relationship between the level of education and earnings.
4. To find out the extent to which other factors affect earnings

1.4 Research questions
1. What is the impact of education on earnings in the mining sector?
2. What are other factors that affect earnings?
3. Is there a relationship between the level of education and earnings?
4. To what extent do other factors affect earnings?
1.5 The hypothesis
There is a positive relationship between earnings of an individual and the level of education.

1.6 Significance of the study
This research is important in aiding the decision-making process of the mining sector as to whether they should continue employing the strategy of offering high incomes in order to attract competent or educated staff or they should refocus their strategies. It also aids the current employees to make decisions on whether to take the route of improving their education in order to improve their welfare or not.

This research is also significant to the researcher in that it also gives an insight on the importance of attaining higher levels of education and it also helps to detect the factors which can increase higher levels of earnings in future. It is also important to the public in detecting the factors which can increase their level of earnings in future. The study helps in policy making by the government, for example on policies to improve education facilities when the results show that there is a positive relationship between education and earnings.

1.7 Assumptions of the study
1. The value of financial inputs is equal to the value of its output.
2. Schooling or education is a form of investment in individual productive capacity.

1.8 Delimitations of the study
The Mining sector is limited to those companies which offer hiring services only and that are registered. The study is going to look directly at the impact of education on earnings in this sector. Also, some factors such as experience, skills etc. are also going to be looked at since they also have a role to play in determining individual earnings.

1.9 Scope of the study
The study is going to look directly at how education affects earnings in the mining industry referring to the gold mining companies in Zimbabwe. It will also look at other factors affecting earnings.
1.10 Limitations of the study

The following are the limitations anticipated and encountered by the researcher in the process:

1. Respondents felt that the information about earnings was sensitive such that it was difficult for them to divulge such information.

2. Some respondents were too suspicious as they regarded the issue of earnings private and confidential.

3. Not all respondents targeted responded because of time and resources.

1.11 Organisation of the study

The preceding chapter introduced the research problem to the reader outlining the necessary details required in order to bring the problem into perspective. The proceeding chapter which is chapter 2 will focus on the literature related to the area of study. It will give both the theoretical and empirical frameworks written by various proponents in the area of earnings and education. In addition, chapter 3 will give an outline of the methodology that will be adopted in order to conduct the research, chapter 4 will focus on data presentation and analysis and lastly chapter 5 will present and provide a discussion which is based on the findings of the research.
CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Education and its expected return to individuals has attracted great interest in literature in both developing and developed countries. The main emphasis of this literature review is to provide theoretical insights into the two main variables of this research which are education and earnings and also how education affects earnings. This chapter seeks to review the work that has been carried out by other scholars on how education affect earnings of individuals. The growth in both theoretical and empirical literature on education in the last two decades is greatly connected with the increasing importance being attached to education in the process of human welfare. The chapter is going to look at different studies carried out by different authors and the improvements made to those studies.

2.1 Theoretical literature

Investment in education has always been justified for its redistribution effects and its high and private social returns compared to other types of investment. Knight and Sabot (2004) indicated that the private as well as the social returns to education have been reasonably high, especially for the lower levels of schooling

1. The Heterogeneous Returns Model

The heterogeneity we are focusing on here is unobserved heterogeneity across individuals in the response parameter $\beta$. Consider the single treatment model where we let schooling $S_{1i}$ for individual $I$ be defined as a binary indicator variable representing the successful achievement of a particular education level - such as obtaining a qualification, obtaining an A level, or undertaking higher education, for example. A completely general relationship between this level of education and earnings in this single discrete treatment heterogeneous returns model is then written

$$\ln y_i = \alpha_i + \beta_i S_{1i} + \varepsilon_i$$  \hspace{1cm} (3)

where $\alpha_i$ and $\beta_i$ can be thought of as random coefficients representing the heterogeneous relationship between educational qualification $S_{1i}$ and earnings. Typically, we would assume
the $\alpha_i$ and $\beta_i$ have a finite population mean and variance. Below the population means are labelled $\alpha_0$ and $\beta_0$ respectively. Despite the preponderance of the homogeneous returns model in the early literature, the recent focus has been on the heterogeneous returns model (3). This raises the immediate question in this model: what is the parameter of interest. Is it the average of the $\beta_i$s? If so what average? Is it the average in the population whether or not level $S_{1i}$ is achieved, $\beta_0$ - the average treatment effect, or the average among those who individuals actually observed with $S_{1i} = 1$, $\beta_T$ - the average treatment on the treated? In some cases, a particular estimation method will recover a local average treatment effect, measuring the impact of $S_{1i} = 1$ on an even smaller subgroup of individuals. We discuss all these in greater detail in the next section.

One interpretation of $\beta_i$ is as a heterogeneous “return” to schooling level $S_{1i}$ for individual $I$ since it measures the marginal proportional impact of this level of education on earnings for individual $i$. Again this measure of returns is a gross private measure since it ignores all costs of education and also taxes paid on gross earnings $y_i$. Note that in the “homogeneous” returns model $\beta_i$ is constant across all individuals. Even so, in this homogeneous return model $\alpha_i$ is allowed to vary across $I$ to capture the differing productivities (or abilities), and differing general levels of earnings, across individuals with the same education levels.

It should be pointed out that this model, and the others to be discussed below, can be readily generalized to allow for observable heterogeneity in both $\alpha_i$ and $\beta_i$. For example, suppose there are a set of observed covariates $X_i$ (e.g. early test scores, demographic variables, aspects of the local labor market). The $\alpha$ and $\beta$ parameters can be made to depend on these in a quite arbitrary way. If they are assumed to depend on $X_i$ in a linear fashion, then the levels of $X_i$ and the interactions of $X_i$ with the education variable $S_{1i}$ will enter the regression specification. The precise form chosen will depend on the richness of the data set and the particular problem at hand. But in what follows we shall always assume that such levels and interactions are included in the specification. Indeed, in the general nonparametric matching method described below a quite general form of interaction is allowed. For the most part we will assume that such observed heterogeneity terms are included, even if this is not explicitly stated in the discussion of the properties of the various alternative estimators described below.

As we saw in the homogeneous model (1), the dependence of the schooling level $S_i$ on the unobserved “ability” component $\alpha_i$ is critical in understanding the bias from standard least squares estimation. An additional central issue in determining the properties of standard
econometric estimators in the heterogeneous effects model is whether or not schooling choice 
$S_1i$ depends on the unobservable determinants of the individual’s marginal return from schooling 
$\beta_i$. If $\beta_i$ were known when the individual makes his or her educational choices then it would 
seem sensible to assume that choices will - in part, at least, reflect the return to earnings of that 
choice. But as mentioned before $\beta_i$ is likely to vary over time and will depend on the relative 
levels of demand and supply, so the dependence of schooling choices on marginal returns is not 
clear-cut. Some persistence in returns is however likely and so some correlation would seem 
more likely than not.

The discussion of heterogeneous returns will extend easily to the multiple treatment model (2). 
Writing the exhaustive set of $J$ treatments (schooling levels) under examination as $S_{1i}, S_{2i}, \ldots, S_{Ji}$. 
The heterogeneous returns model is then

$$
\ln y_i = \alpha_i + \beta_{1i} S_{1i} + \beta_{2i} S_{2i} + \ldots + \beta_{Ji} S_{Ji} + \epsilon_i. 
$$

(4)

We will also want to discuss the one factor model in which $S_i$ enters as a single continuous 
variable

$$
\ln y_i = \alpha_i + \beta_i S_i + \epsilon_i. 
$$

(5)

In fact, the three basic specifications (3), (2) and (5) will form the main alternatives considered 
here. The single discrete treatment case (3) being the baseline specification.

2.1.1 Credentialist theory.

According to the credentialists’ (Evans et al, 2002) education is considered as a credential when 
salary scales are determined. Consequently, people have to invest in education if they want to 
earn more in future and advance in the occupation ladder. This theory states that, when 
comparing earnings or salaries of individuals, education must be the most factor that will be 
considered. It focuses on the formal scale rather than on what lies behind in the determination 
of the salary scale. This means that the salary scale in some sense must be a reflection of the 
contribution or rather the relative contributions of labour with different levels of education.

Through this approach, the wage setting is very common in the public sector. This means that 
there will be a minimum wage set by the government for every employee. It is then hard to
conclude educational qualification has no relation whatsoever to the contribution which a person with a given level of education can make in a specified job.

2.1.2 Signalling Theory

The second approach is the signalling approach. According to this approach by Roland Akbazee, (2009), the level of education attained serves as a signal of individual productivity. Only those with high productivity potential can achieve higher levels of education. In this view, the most-able invest more in their education to signal their ability to prospective employers. The employers knowing about this process of self-selection (only the hardworking and able individuals acquire higher education levels) base their employment and wage policy on educational attainment. This mean to say that, what the employer is willing to pay is not the academic merit of the prospective employee but the inherent ability of the employee as reflected by his decision about the level of investment in education. Whatever contribution the employee may make is attributed not to the person’s education but to his/her innate ability. Admittedly individual ability is important in determining productivity both in the process of acquiring on the job. Given a level of individual ability more education will increase the adaptability, capability and flexibility of the individual at the workplace.

This approach shows that education is more than just a signal of individual ability. Firms pay for the value for both as a select mechanism and as a productivity enhancing mechanism. The latter aspect cannot and should not be ignored in any way that is educational level really affects earnings.

Education is conventionally thought to bring private and social benefits through raising earnings in wage employment, with wages expected to be higher for more educated workers. It should equip individuals to better compete in the knowledge based economy as it provides students with critical higher level skills and knowledge for advanced learning and training of professionals.

2.1.3 Human capital theory

Human capital according to Schultz (1971) focuses on education as a capital good and emphasizes that the development of skills is an important factor in production activities. It represents the investment people make in themselves that enhances the economic productivity.
The theoretical framework most responsible for the wholesome adoption of education and development policies has come to be known as human capital theory. Based upon the work of Schultz (1971), Sakamota and Powers (1995), Psacharopoulos and Woodhall (1997), human capital theory rests on the assumption that formal education is highly instrumental and even necessary to improve the production capacity of a population. In short, the human capital theorists argue that an educated population is a productive population.

This theory also emphasizes how education increases the productivity and efficiency of workers by increasing the level of cognitive stock of economically productive human capability which is a product of innate abilities and investment in human beings. The provision of formal education is seen as a productive investment in human capital, which the proponents of the theory have considered as equally or even more equally worthwhile than that of physical capital.

The human capital theory also goes on to assume that education provides productive skills to individuals and employers are willing to reward higher productivity even though there are other theories arguing that there is no productivity argument involved and education is just used as a legitimised means for social closure and exclusion. This theory stresses that people acquire productive skills in school so that people invest in schooling in order to become more productive and get rewarded for it. It also argues that although education does not generate ready to use skills, it makes people more easily trainable on the work floor, thereby reducing training costs.

Earnings differentials will quickly attribute entirely to skill differences in what we will term a Walrasian model. Hourly wages can be viewed as a measure of the productive value of an employee on the assumption that differences in wages reflect differences in the marginal value of production. This means that a more productive worker will receive a higher reward for his/her labour and that reward will reflect the skills, knowledge and ability. Also, hourly wages are related to the level of skills one possess, people with low skills have a relatively restricted range of hourly wages compared to people with higher skills (Koenker R 2001), noted that a 50% difference in skills is associated with a 20% difference in hourly earnings.

On the other hand, labour experience is generally found to be positively related to earnings. The implication for this is that the returns to labour market experience may be skewed towards higher paying professional occupations with lower levels of education. Thus there is a
possibility link between earnings and work experience in occupations with lower levels of education. A worker’s labour market experience is assumed to be a suitable proxy for the off and on the job training.

2.1.4 New models of human capital theory
Building on human capital theory, Cunha and Heckman (2009) have developed a perspective to assess education policies over the life cycle of an individual. An investment in education matters in so far as skills are successfully acquired. Skills acquired over the life cycle are complementary with two important facts. The first one can best be summarized by Heckman’s words “skills beget skills”. This is because already acquired skills are an input to the acquisition of further skills. The second factor is that the acquisition of further skills is more productive when the skills were acquired earlier on. These factors result in a skill multiplier by which an investment in education at one stage raises the skills attained at that stage but also the productivity of the transformation of future educational investments in to skills.

Cunha and Heckman’s theory of human capital also states that if education at secondary level is of insufficient quality, then the productivity with which investments in education at tertiary level are translated into valuable skills will be negatively affected. Investment in secondary level education in turn are more productive if the young have acquired skills, in primary, pre-primary education institutions and of cause in the home.

The theories above clearly stated the importance of education since it has got some positive impacts on individual earnings. This shows that a formal and focused education is an essential ingredient if one wants to maximize earnings. Employers have and are increasingly using the level of education or the qualification one holds as a way of screening applicants or employees.

2.2 Empirical literature
Further education undertaken by an individual once formal education is completed appears to increase wage employment earnings significantly. This is a comforting result given the heavy investments secondary school levers make in further education and training. It is perhaps convenient to commence discussion with the work of George Psacharopolous (2000), which provides a competitive review of the literature on returns to education investment. Psacharopolous carried out his research in 1999 in Nigeria and assumed that education is the only factor that affects earnings.
During his study, he used various methods of data collection and they include, correspondence with researchers known to be working on the subject, an update of earlier compilations, answers by national experts to 51 questions in the project specific questionnaire regarding any recent estimates of the returns to investment in education or data on earnings of higher education graduates relative to earnings of those who did not complete higher education. He also used sampling as a method of collecting his data.

However, the argument about these is that some of these differences in average wages between education levels could be due to differences between workers at each level in other respects – determining characteristics like experience, age and training. Furthermore, Ella (2001), noted that there was a problem of sample selectivity. The possibility of sample selection bias arises whenever one examines a subsample and the unobservable factors determining inclusion in the subsample are correlated with the unobservable influencing the variable of primary interest.

In order to make the research by Psachropolous more realistic, Mincer (2001) estimated on earnings equation with a variety of controls for other earnings determining characteristics as well as dummy variables for each educational level. The basic earnings function according to Mincer (2001) in UK, involves the fittings of a semi log ordinary least squares (OLS) regression using the natural logarithm of earnings as the dependant variable and the years of labour market experience and its square as independent variable. In this approach, the coefficient on years of schooling can be interpreted as the average private rate of return to one additional year of education regardless of the additional level to which this year of schooling refers (Grindling 2001).

Earle (2009) used the OLS estimation to see the effect of experience on earnings. In his analysis, he noted that experience is assumed by age and has the strongest effect on increasing earnings for people in higher earnings jobs and has little effect on increasing earnings for those people in low earnings jobs. However, it is also noted that correlations vary by race, gender and ethnicity but the positive relationship between experience and earnings will continue to exist.

Earle (2009) also used data from the Adult literacy and Life Skills survey so to look at the overall relationship between skills, qualifications and wages among individuals. The analysis showed that a one standard deviation difference in literacy or numeracy skills accounted for, on average, a 20 percent difference in hourly wages. This is similar to the average increase in
earnings associated with holding a tertiary non degree qualification, compared with having a school-level qualification or the average increase in earnings associated with having a degree compared with a tertiary non degree qualification. When literacy or numeracy skills and qualifications were considered together, the increase in wages attributable just to literacy differences was reduced to around 10 percent for each standard deviation difference in literacy or numeracy skills. A change of one standard deviation is equivalent to a change of one level on the literacy and numeracy scales derived from the ALL survey as presented Satherley, Lawes and Sok (2008) and other reports.

Earle also noted that earnings can be explained by a number of factors which include age and gender. Overall women have lower hourly wages than men. This is because men are capable of doing more challenging jobs where women will be considered weak. These differences also persist across qualification levels with the smallest difference being at degree level. Average hourly wages increase with age up until the age of 45 and then decrease after that. This was mainly because a lot of people retire after reaching this age.

Psacharopoulos (1997b) also carried out a research using the special wages and salaries survey (SWSS) in which he included all urban areas and all (non-farm) sectors of the economic activity. The sample included almost 9000 wage and salary earners in twelve big cities and the information collected suitable for investigating the returns to human capital. The data set was used by Psacharopoulos (1982) and Patrinos (1992, 1995). Payroll data for the early 1960s and two small scale surveys carried out by Leibenstein (1967) were used subsequently.

Likewise, payroll data for small samples of employees working in a few large private sector firms, two ministries and a state controlled bank for 1971 to 1987 were used. The survey used the simple OLS technique and the standard Mincerian semi-logarithmic capital earnings function for the investigation of the impact of education on earnings. Even though the information contained in some of the data sets is very rich, it is doubtful whether the picture those earnings from them regarding private returns to education is representative of all wage and salary earners in the corresponding years.

Studies have proved that investment in human capital leads to increased income earning capacity with increase in both private and social rates of return with education attained. In his study Appleton (2001) found that in Uganda mean wages were higher for more educated
workers and wage earnings were 305 higher for people with complete secondary education than those with only completed primary education.

Despite the inherent difficulty most authors support the human capital explanation (Woessman, 2006). In particular, Sianesi and Van Keenan (2003) provide evidence that education is productivity-enhancing rather than a mere device used by individuals to signal their level of ability to the worker. Ciccone and de la Fuente (2002) also confirmed causation from education to productivity. Most studies on rates of return to schooling do not explicitly distinguish between primary, secondary and tertiary education. Furthermore, returns to education can vary across the population and the marginal return to schooling is a decreasing function of schooling (Card 1999).

2.3 Conclusion.
The chapter has looked at different theories that were put across by many authors in trying to explain the relationship between education and earnings. The following chapter is going to look at how that data was collected and the procedures to collect the data in trying carrying out the research

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction
This section seeks to entail the theoretical approach that the research has adopted, econometric methodology, variables and variables justification as well as diagnostic tests that will be carried out to determine the best method to employ.
3.1 Theoretical method
Recent studies of education and wage determination are almost always embedded in the framework of Mincer's (1974) human capital earnings function (HCEF). According to this model, the log of individual earnings (y) in a given time period can be decomposed into an additive function of a linear education term and a quadratic experience term. The functional form is given as

\[ Y = F[S,A] \]

Therefore the linearised form of the model if given as

\[ \log y = \alpha + \beta S + \gamma X + \delta X^2 + \varepsilon \]

Where S represents years of completed education,

X represents the number of years an individual has worked since completing schooling, and \( \alpha, \beta, \gamma \text{ and } \delta \) are parameters for the explanatory variables

\( \varepsilon \) is the error term

In the absence of direct information on experience Mincer proposed the use of "potential experience": the number of years an individual of age A could have worked, assuming he started school at age 6, finished S years of schooling in exactly S years, and began working immediately thereafter:

\[ X = A - S - 6 \]

3.2 Model specification
The main agenda of this research is to assess the impact of education on earnings in the mining sector. Following the theoretical model above by Mincer [1974], the correctly specified model is given as

\[ \log y = \alpha + \beta_1 ED + \beta_2 XX + \beta_3 G + \beta_4 Age + \varepsilon \]

where \( Y \) - earnings

ED – years of completed education
EX – working experience

G – gender

Age - age

3.3 Description and justification of variables

Dependent variable

3.3.1 Earnings [logy]
The literature on the human capital earnings function has analyzed a variety of earnings measures that is annual, weekly, hourly, almost always in logarithmic form. The popularity of the log transformation reflects several factors. For one, the distribution of log earnings (especially log hourly wages) is surprisingly close to a normal distribution. Eckman and Polachek (1974) investigated alternative transformations of earnings and concluded that the log transformation is the best in the Box-Cox class. Finally, and perhaps as important as any other consideration, the log transformation is convenient for interpretation hence the study used a log transformation function for earnings.

Independent variables

3.3.2 Education [S]
The standard human capital earnings function dictates that log earnings are a linear function of years of completed education. Blundell et al 2004 stated that there are two (related) hypotheses embedded in this specification: first, that the correct measure of education is the number of years of completed education; and second, that each additional year of schooling has the same proportional effect on earnings, holding constant years in the labor market. Years of schooling has substantial face validity in single education stream like the Zimbabwean, US education system, but is less natural in countries with multiple education streams where high school graduation may entail different years of schooling depending on whether a student plans to go to university, vocational college, or start work right away. Even within the US many analysts have argued that credentials (such as a high school diploma or college degree) matter more than years of schooling per se [Blundell et al 2004]. This hypothesis has come to be known as the "sheepskin effect" thus the existence of wage premiums for fulfilling the final years of elementary school, high school, or college. The expected relationship is positive.
3.3.3 Gender [G]
Gosling [2000] stated that ‘in order to focus fully on the returns to education and to avoid issues associated with selection into employment, we restrict our attention to males’. Therefore, the study includes gender so as to capture the variations in employment selection process and also to capture the disparity that women are a victim of male chauvinism hence, they should not have the same degree of educational access than men. The variable is a dummy variable and will take a value of 1 for male and if otherwise female.

3.3.4 Working experience [EX]
Mincer [1974] stated that an individual’s working experience has a positive impact on his or her earnings. The basis for this assertion is that as the number of years for an individual serving at a single company increases, he and/or she is more likely to earn more income since his service will be recognized and seen as a loyal employee to the organization. The variable will be able to capture if the norm that long serving employees have higher earnings compared to short serving employees and newbies.

3.3.5 Age [Age]
Dam and Hotwani [2017] stated that age is the time of life at which some particular qualification, power, or capacity arises or rests, hence, there is a positive relationship between income and age. As a result, the variable was included in the model to ascertain whether income is influenced by age in the mining sector. The expected relationship is positive.

3.4 Descriptive statistics
It is of high importance that before manipulation of the data, the research performs certain tests such as descriptive statistics, correlations and unit root so as to determine whether the data is suffering from econometric problems such as autocorrelations, multicollinearity so as to avoid problem of spurious regression analysis. In order to avoid production of spurious regression associated with panel time series data, a number of diagnostic tests were carried out.
3.5 Diagnostic tests

3.5 Unit root test
Maddala and Wu 1999 stated that contemporaneous results and misleading conclusions are as a result of using non-stationary data in making inferences. In order to prevent this problem, it is commonly accepted to conduct checks for stationarity using the Augmented Dickey Fuller [ADF] test in conjunction with other tests for unit root such as Philip-Perron test so as to enhance the soundness of the results.

Hypothesis $H_0$ variable contains a unit root problem

3.5.1 Decision rule and conclusion
Reject the null hypothesis if the p-value is less than the critical p-value of 0.05 and conclude that the variable contains a unit root at 0.05 level of significance, if otherwise reject the null hypothesis and conclude that the variable does not contain a unit root.

3.6 Autocorrelation Test
Gujarati [2013] defined autocorrelation as “correlation between members of series of observations ordered in time [as in time series data] or space [as in cross-sectional data].” In the regression context, the classical linear regression model assumes that such autocorrelation does not exist in the disturbances term. The classical model assumes that the disturbance term relating to any observation is not influenced by the disturbance term relating to any other observation. To test for the presence of serial correlation the Breusch-Godfrey test will employed as well as the Durbin-Watson test as a secondary approach to reinforce the B-G test results.

Hypothesis $H_0$ There is no serial correlation

3.6.1 Decision rule and Conclusion
Reject the null hypothesis if the critical p-value is greater than 0.05 and conclude that there is no serial autocorrelation among the independent variables otherwise reject the alternative hypothesis and conclude that there is serial autocorrelation among independent variables.
3.7 Heteroscedasticity Test
Heteroscedasticity arises if the error terms in a model do not have constant variance and is mostly a problem in cross-sectional data. Heteroscedasticity arise if the model is misspecified [due to an omitted variable] such that the specification error induces heteroscedasticity. Heteroskedasticity can also arise as a result of the present of outliers, that is, an observation that is much different than the other observation in the sample. Heteroskedasticity in logistic regression can produce biased and misleading parameter estimates. One of the important assumptions of the classical linear regression model is that the variance of each disturbance term, conditional on the chosen values of the explanatory variables, is some constant number. Halunga et al [2011] proposed that the Breusch-Pagan-Godfrey heteroscedasticity test of zero null hypothesis for contemporaneous correlations is easy to conduct and interpret henceforth the research employs this test. The null hypothesis is that the residuals are time variant against the alternative that the residuals are non-time variant. The findings from the BPG test for heteroscedasticity will be reinforced by the white test result.

Hypothesis $H_0$ The residuals are time variant.

3.7.1 Decision rule and Conclusion
Reject the null hypothesis if the critical $p$-value is greater than 0.05 and conclude that there is no serial autocorrelation among the independent variables otherwise reject the alternative hypothesis and conclude that there is serial autocorrelation among independent variables.

3.8 Multicollinearity Test
Multicollinearity is the existence of ideal or perfect linear correlations among the regressor in the model [Gujarati, 2013]. It can be detected by examining tolerance and its reciprocal the variance inflation factor [VIF]. The VIF is used to measure how much of the inflated variance of estimated coefficient when multicollinearity exists. If the value of VIF is greater than 5 there is multicollinearity [Rogerson, 2001] and Kennedy [2008] posited that if the VIF value is greater than 10 then the variables are highly correlated. $VIF_k = \frac{1}{1-R_{kk}^2}$

Thus, the hypothesis to be tested is

$H_0$ No multicollinearity among regressors
3.8.1 Decision rule and conclusion
The rule of thumb is that if VIF is greater than 5, conclude that there is multicollinearity and if it is greater than 10 there is very serious multicollinearity, if otherwise there is no severe multicollinearity.

3.9 Conclusion
In this part of the study the researcher has highlighted the research methodology, model specification, justification of variables and also outlines the diagnostics tests that must be carried out as well as data type and sources.

CHAPTER FOUR
DATA ANALYSIS AND PRESENTATION

4.0 Introduction
The chapter presents the analysis, presentation and interpretation of the research findings. The results were presented in the form of tables and graphs. The interpretation of the findings was also supported by various scholars from literature review.

4.1 Response rate
Converse et al (2013) defined that response rate is the proportion of completed and returned questionnaires in relation to distributed to selected study population. The researcher distributed 160 questionnaires and 157 questionnaires were returned. After screening only 150 questionnaires were completed correctly thus an average of 93.75% response rate.
4.2 Descriptive statistics

It is of high importance that before manipulation of the data, the researcher performs certain tests such as descriptive statistics, correlations and unit root so as to determine whether the data is suffering from econometric problems such as autocorrelations, multicollinearity so as to avoid problem of spurious regression analysis. The descriptive statistics of the dependent and explanatory variable are summarised below.

Table 4.1 Descriptive statistics results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Standard deviation</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED</td>
<td>14.66</td>
<td>17</td>
<td>11</td>
<td>2.0524</td>
<td>150</td>
</tr>
<tr>
<td>G</td>
<td>0.7933</td>
<td>1</td>
<td>0</td>
<td>0.4063</td>
<td>150</td>
</tr>
<tr>
<td>AGE</td>
<td>44.7263</td>
<td>54</td>
<td>35</td>
<td>5.4031</td>
<td>150</td>
</tr>
<tr>
<td>EX</td>
<td>10.2133</td>
<td>35</td>
<td>2</td>
<td>5.5036</td>
<td>150</td>
</tr>
</tbody>
</table>

The results indicate that the average educational level of middle-income earners in the mining sector is ordinary level and the maximum level is university degree as measured by the number of years spent at school with an average of spending 14 years at school. Furthermore, the minimum level of experience is 2 years and maximum of 35 years with an average of 10 years working experience in the mining sector.

4.3 Diagnostic Test

Pre-regression analysis was done before inferring conclusions about the estimated results and the following shortlisted test were undertaken that is unit root, multicollinearity, heteroscedasticity, and autocorrelation test to check the reliability and validity of the results.

4.3.1 Unit Root Test

Unit root problem was tested using the Dickey-Fuller test. For all variables at 5% significance level reject the null hypothesis if otherwise reject the alternative hypothesis a condition for stationarity.

Table 4.2 Unit Root Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Dickey-Fuller statistic</th>
<th>Probability value</th>
<th>Integral order</th>
<th>Decision</th>
</tr>
</thead>
</table>

The regressor that is educational level, age, gender, and experience are all stationary and have order one of integration.

### 4.3.2 Autocorrelation Test

The presence of serial correlation was tested by the Breusch-Godfrey autocorrelation test and the results are shown in the table below. Do not reject the alternative hypothesis if probability value is smaller than .05, if otherwise reject H0, conclude that serial correlation is not present.

<table>
<thead>
<tr>
<th>Test</th>
<th>Chi-square</th>
<th>Probability value</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breusch-Godfrey</td>
<td>48.613</td>
<td>0.0000</td>
<td>There is serial correlation</td>
</tr>
</tbody>
</table>

A probability value of 0.000 is lesser than 0.05, do not reject the null hypothesis and conclude that autocorrelation is present that is the variables used in regression analysis exist effective.

### 4.3.3 Multicollinearity Test

Gujarati (2013) defined “multicollinearity as the presence of perfect linear correlation among some or all independent variables of a regression model making precise estimation difficult”. Findings of multicollinearity are indicated below.

<table>
<thead>
<tr>
<th>Variable</th>
<th>VIF</th>
<th>$1/VIF$</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED</td>
<td>1.02</td>
<td>0.983927</td>
</tr>
<tr>
<td>EX</td>
<td>1.02</td>
<td>0.984145</td>
</tr>
<tr>
<td>AGE</td>
<td>1.02</td>
<td>0.984971</td>
</tr>
<tr>
<td>G</td>
<td>1.01</td>
<td>0.991079</td>
</tr>
</tbody>
</table>
Mean 1.01

Rogerson (2001) argued that if the value of VIF is greater than 4 conclude that there is multicollinearity. Since VIF is less than 4 we conclude that there is no multicollinearity.

4.3.4 Heteroskedasticity test
Heteroskedasticity arises if the error terms in a model do not have constant variance and is mostly a problem in cross-sectional data. Heteroskedasticity arise if the model is misspecified (e.g., due to an omitted variable) such that the specification error induces heteroskedasticity. Heteroskedasticity can also arise as a result of the presence of outliers, that is, an observation that is much different than the other observations in the sample.

Table 4.5 Heteroskedasticity results

<table>
<thead>
<tr>
<th>Test</th>
<th>Chi-square</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breusch-Pagan</td>
<td>0.27</td>
<td>0.6017</td>
</tr>
</tbody>
</table>

The results indicate that the data does not suffer from heteroskedasticity.

4.4 Estimation and Presentation of Regression Results
The Ordinary Least Squares regression analysis was employed to assess the impact of education, age, gender and working experience has on income of middle-income earners in the mining sector concentrating more on gold mines. The results are presented in the table below.

Table 4.6 OLS Regression Analysis Results

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>COEFFICIENT</th>
<th>STD ERROR</th>
<th>T-STATISTIC</th>
<th>P-VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education [ed]</td>
<td>0.2712</td>
<td>0.0158</td>
<td>17.14</td>
<td>0.0000</td>
</tr>
<tr>
<td>Gender [g]</td>
<td>0.1263</td>
<td>0.0966</td>
<td>1.31</td>
<td>0.193</td>
</tr>
<tr>
<td>Age [age]</td>
<td>0.0538</td>
<td>0.0054</td>
<td>9.91</td>
<td>0.000</td>
</tr>
<tr>
<td>Experience [ex]</td>
<td>0.0144</td>
<td>0.0072</td>
<td>2.00</td>
<td>0.047</td>
</tr>
</tbody>
</table>

\[ R^2 = 0.9948 \quad \text{Adjusted } R^2 = 0.9946 \]
The results in the table above signal that education, age and working experience are statistically significant determinants of income in the mining sector whilst gender is not a statistically significant variable in explaining an individual’s income in the industry. All the variables are positively related to income in the mining industry. Moreover, the variations in income are 99.48% explained by education, gender, age and experience and the model is also correctly specified as specified by a p-value of 0.0000. Therefore, the estimated equation is as follows:

\[ \text{LNINCOME}_i = 0.2712ED_i + 0.1263G_i + 0.0538AGE_i + 0.0144EX_i \]

4.5 Interpretation of the Results

The results signposted that variations in income in the mining sector are statistically explained by an individual’s educational level, age and working experience. Gender does not have any statistically significant effect on income in the mining sector.

4.5.1 Education

The standard human capital earnings function dictates that log earnings are a linear function of years of completed education. The findings entail that in the Zimbabwean mining sector education has a vital role in determining an individual’s level of income and is strongly statistically significant at explaining the variations in income with a p-value of 0.0000. Moreover, a unitary increase in the number of years at school results in a 0.2712 increase in an individual’s income.

According to this study, it shows that education has a positive relationship with earnings. Blundell et al 2004 stated that the correct measure of education is the number of years of completed education and has a positive influence on income.

The connection between education and earnings is very strong. A high school diploma, technical college certificate, or college degree not only increases one’s skills and productivity, but signals to employers that the individual is motivated and completes tasks. A more educated individual is more likely to participate in the job market, to have a job, to work more hours, and to be paid more, and less likely to be unemployed (French and Fisher 2009)
However, the benefits of education go beyond the economic returns. Higher levels of education also correspond to improved health and lower rates of mortality, and lower rates of crime (Grossman and Kaestner 1997; Lleras-Muney 2005; Lochner and Moretti 2004).

4.5.2 Experience
As a result, working experience positively influence an individual income in the mining industry, therefore a unitary increase in working experience will result in a 0.0144 increase in income. The variable is statistically significant in explaining differences in income at 5% level of significance. Mincer [1974] stated that an individual’s working experience has a positive impact on his or her earnings. The basis for this assertion is that as the number of years for an individual serving at a single company increases, he and/or she is more likely to earn more income since his service will be recognized and seen as a loyal employee to the organization.

At the end of the day, what a worker can actually accomplish is going to be the biggest determinant of pay. A skilled litigator with a law degree from Harvard is going to earn substantially more than an unskilled litigator with a law degree from Harvard. Typically, skill and ability are result of experience. Employers look at years of experience as a good indicator of a worker's skill level and productivity. Workers with both experience and in-demand skills usually earn more that workers in the same occupation that lack similar skills and experience.

4.5.3 Age
The results signpost that age positively influence income in the mining industry and it is statistically significant at 1% level of significance. These findings are in tandem with those of Dam and Hotwani [2017] who stated that age has a positive bearing impact on income. A unitary increase in age results in 0.0538 increase in income. This is likely the reason because the older an individual is the lesser the chances of moving from one job to another hence his/her loyalty lies within the company.

Earle 2009, also noted that earnings can be explained by a number of factors which include age and gender. Overally women have lower hourly wages than men. This is because men are capable of doing more challenging jobs where women will be considered weak. However, these differences also persist across qualification levels with the smallest difference being at degree level. Average hourly wages increase with age up until the age of 45 and then decrease after that. This was mainly because a lot of people retire after reaching this age.
4.6 Conclusion
The researcher outlined the results of diagnostic tests carried out in the study and also presented the Ordinary Least Squares [OLS] estimators. The results outlined include multicollinearity, heteroscedasticity, unit root and further checked for serial correlation tests. OLS regression results showed that education, age and experience have a positive impact on an individual’s income in the mining sector. The next section of the research seeks to address issues such as research precipitation.

CHAPTER FIVE

CONCLUSIONS AND POLICY RECOMMENDATIONS

5.0 Introduction
This chapter is going to look at the summary, policy recommendations and conclusions basing on the results obtained in chapter four. The researcher is going to look at the overall findings of the research and the conclusions that can be drawn from the research.

5.1 Key findings and conclusions
The study found out that there is a positive relationship between earnings and education. As individuals attain higher levels of education, their earnings in future tend to be higher than those with lower education levels. Education affects earnings but there are also other factors that affect individual earnings such as age, gender, working experience and marital status. From the responses from the questionnaire, a lot of people are aiming at attaining higher levels of education anticipating that they will get more earnings in the future.
Although the level of education affects earnings, working experience also has got a positive relationship with earnings. This means that an individual with many years of experience in the same company can earn more than a person with less experience. This is because the person has gained loyalty in the company for working so many years in the same company.

5.2 Recommendations
Education has so many benefits to individuals, apart from gaining knowledge, people will be more skilled enough even for the technological advancement, people are able to adapt quickly. In developing countries like Zimbabwe, the government has realized these benefits of education to individuals hence the economy will heavily raise the expenditure on improving the educational facilities in the country, hence shouldering an enormous burden on the economy. Therefore, there are other things that the government can do to improve the educational facilities in the country.

The tertiary education, that is the Universities which attracts the highest magnitude of returns should be properly funded and well equipped with modern technology especially the information systems, laboratories, libraries and infrastructure. Private companies in the mining industry and those private individuals who are receiving higher earnings as graduates of some of these institutions should be able to pay in some of these investments.

The government can also be able to improve its public sector earnings through the increase in remunerations and this will attract workers in the mining sector to concentrate more and to be productive. For example, most of the civil servants in Zimbabwe engage in so many personal trading and businesses in order to supplement their earnings which causes their interest to be divided and lowers their personal productivity at work.

The policy makers or the government should be able also to encourage more private investments in the economy by providing a suitable environment and good policies for investment. This will lower the levels of unemployment and encourage investment in education since graduates will be assured of ready employment after they have graduated. The higher the levels of education the higher the rate of return to the individual. The government should put more effort to improve the quality and investment in this level of education by encouraging private individuals to invest in higher education.

The government should be able to increase more mining institutions. This can be done by building more schools and it must be able to encourage the companies in the mining sector to
invest in these schools such that they will get more educated people in the industry. This will in future not benefit the mining sector alone by an increase in productivity but the increase in GDP as well. As the number of students studying mining increases, the quality of teaching also needs to be maintained. This can be done through funding the schools with more effective laboratory tools to be used. The government also needs to encourage private sector funding of these tools.

5.3 Summary

Education remains a profitable investment opportunity both from private and social points of view. People or individuals regard education as an investment in human capital. It is termed human capital because people cannot be separated from their knowledge skills and even experience which are earned through attaining education. This study has shown that further education greatly raise a person’s earnings even after netting out direct and indirect costs of schooling. The earnings of more educated people are almost well above average those of their less educated counterparts.

The results have also shown that education alone cannot individual earnings but it works hand in hand with other factors such as skills, experience, gender, marital status in affecting individual earnings
Reference List


Resnik, D. B. (2015, December). *What is ethics in research & why is it important*. In ideas.
## APPENDIX 1: RESULTS

### Unit root results

#### Educational level

```
.dfuller ed
```

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>1% Critical Value</th>
<th>5% Critical Value</th>
<th>10% Critical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Z(t))</td>
<td>-5.019</td>
<td>-3.494</td>
<td>-2.887</td>
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</tbody>
</table>

MacKinnon approximate p-value for \(Z(t)\) = 0.0000

### Age
Dickey-Fuller test for unit root
Number of obs = 149

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>Interpolated Dickey-Fuller</th>
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<tr>
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<tr>
<td>Z(t)</td>
<td>-12.585</td>
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</tbody>
</table>

MacKinnon approximate p-value for Z(t) = 0.0000

Gender

Dickey-Fuller test for unit root
Number of obs = 149

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>Interpolated Dickey-Fuller</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>1% Critical Value</td>
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<tr>
<td>Z(t)</td>
<td>-11.856</td>
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</tbody>
</table>

MacKinnon approximate p-value for Z(t) = 0.0000

Experience

Dickey-Fuller test for unit root
Number of obs = 149

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>Interpolated Dickey-Fuller</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1% Critical Value</td>
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<tr>
<td>Z(t)</td>
<td>-12.636</td>
</tr>
</tbody>
</table>

MacKinnon approximate p-value for Z(t) = 0.0000

Heteroscedasticity test
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of lincome

chi2(1)  =  0.27
Prob > chi2 =  0.6017

.

Multicollinearity test

. estat vif

<table>
<thead>
<tr>
<th>Variable</th>
<th>VIF</th>
<th>1/VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>ed</td>
<td>1.02</td>
<td>0.983927</td>
</tr>
<tr>
<td>ex</td>
<td>1.02</td>
<td>0.984145</td>
</tr>
<tr>
<td>age</td>
<td>1.02</td>
<td>0.984971</td>
</tr>
<tr>
<td>g</td>
<td>1.01</td>
<td>0.991079</td>
</tr>
</tbody>
</table>

Mean VIF 1.01

Autocorrelation test

. estat bgodfrey

Breusch-Godfrey LM test for autocorrelation

<table>
<thead>
<tr>
<th>lags(p)</th>
<th>chi2</th>
<th>df</th>
<th>Prob &gt; chi2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>48.613</td>
<td>1</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

HO: no serial correlation

Regression Analysis Results
APPENDIX 2: QUESTIONNAIRE

```plaintext
.reg lincome ed g age ex, noconstant

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>Number of obs = 150</th>
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</thead>
<tbody>
<tr>
<td>Model</td>
<td>6658.32347</td>
<td>4</td>
<td>1664.58087</td>
<td>F(4, 146) = 6947.60</td>
</tr>
<tr>
<td>Residual</td>
<td>34.9802362</td>
<td>146</td>
<td>.239930659</td>
<td>Prob &gt; F = 0.0000</td>
</tr>
<tr>
<td>Total</td>
<td>6693.30371</td>
<td>150</td>
<td>44.6220247</td>
<td>R-squared = 0.9948</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adj R-squared = 0.9946</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Root MSE = 0.40940</td>
</tr>
</tbody>
</table>

| lincome | Coef. | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|---------|-------|-----------|-------|-------|----------------------|
| ed      | .2712186 | .0158256 | 17.14 | 0.000 | .2399418 | .3024954 |
| g       | .1262695 | .0965565 | 1.31  | 0.193 | -.0645596 | .3170986 |
| age     | .0538053 | .0054296 | 9.91  | 0.000 | .0430744 | .0645361 |
| ex      | .014445  | .0072133 | 2.00  | 0.047 | .000189  | .028701  |
```
My name is Caroline Chimhępọ, a fourth-year student at Bindura University of Science Education, pursuing a Bachelor of Science Honours Degree in Economics. I’m currently involved in carrying out a research in partial fulfillment of the degree program. The focus of this research is concerned with investigating the impact of education on earnings in gold mining firms in Zimbabwe. I would be most grateful if you would spare your time and complete the questionnaire below. Your responses will be treated with uttermost confidentiality and will strictly be used for academic purposes only. Your cooperation is greatly appreciated.

INSTRUCTIONS

✓ Indicate your answers with an (X) in the appropriate block.
✓ For the open-ended questions express yourself freely
✓ Please do not write your names for confidentiality purposes

KINDLY FILL IN THE SPACES PROVIDED BELOW.

1) Kindly indicate your age group. **Indicate with an X**

20-30 years  
31-40 years  
41-50 years  
Above 50 years

2) Please indicate your gender or sex. **Indicate with an X**

Male  
Female

3) Please indicate your marital status. **Indicate with an X**

Single  
Married  
Divorced  
Widowed  
Separated
4) Region of Origin.

5) Occupation

6) Time worked at the current organization. (in years). Indicate with an X

1 year  2years  3years  4years  5years

7) Level of education. Indicate with an X

   Below O’level (7 years)  
   O’ level (11 years)  
   A ‘level (13 years)  
   Diploma (15 years)  
   Degree (17 years)  
   Master’s Degree  
   PHD  

8) Time completed in attaining the highest level of education. Indicate with an X

   7 years and below  
   11 years  
   13 years  
   15 years  
17 years

Above 17 years

9) Is education the only factor that affect individual earnings. Indicate with an X

Yes [ ]
No [ ]

10) Why do you say so?

11) From your own perspective, is it beneficial to acquire the highest level of education?

Yes [ ]
No [ ]

12) State the reasons why you say so.

13) Remunerations or Earnings obtained

Less than 250 [ ]
250-500 [ ]
500-750 [ ]
750-1000 [ ]
1000-2500 [ ]
Above 2500 [ ]

THANK YOU FOR YOUR COOPERATION AND PATIENCE!!