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CHAPTER

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The primary objective for both the micro and macro part of this study was to determine whether the level of tertiary education significantly influences the income of tertiary educated individuals within South Africa, and within the School of Economics. The secondary objective was to identify other factors that might influence the monthly income before tax and general deductions of tertiary educated individuals; these factors include age, gender, population group, marital status, year of matriculation, field of study, employed while studying, occupation, average weekly working hours, province of primary employment, and years of working experience. The reason that the study was conducted was to contribute valuable insight into the earning dynamics of tertiary educated individuals and the factors influencing an individual's potential income for both South Africa as well as the North-West University's School of Economics. The second reason was to gain further insight into the extent to which tertiary education plays a role in the increase of income; or as otherwise stated, the rate of return to education.

Determining the extent to which the level of tertiary education plays a role will facilitate current and future students in determining their optimal years of education; as well as providing some insight into the labour market outcomes for the levels of tertiary education within South Africa and for the North-West University's School of Economics. As stated in chapter 1, education in a broader context is a vital component in economic growth and development. It promotes greater economic stability and increases general living standards.

Chapter 1 contained the introduction and problem statement of this study as well as highlighting the significance of education in relation to income, and its significance when considering economic development. Chapter 1 also included a set of primary and secondary objectives for this study, with the primary focus on determining education's significance in relation to income.

Chapter 2 provided an overview of both South African and international literature regarding the significance of tertiary education in relation to income, with a special focus on the rate of return to tertiary education. Chapter 2 also provided a literature overview on other factors that have a significant influence on income, such as age, population group, gender, marital status, and occupation.

Chapter 3 provided an analysis of the questions that were asked in the questionnaire, as well as rendering a report on the raw data obtained from both the NIDS and Alumni data set. From the raw data, it appeared that the level of tertiary education does have a positive relationship with income for both data samples.

Chapter 4 considered the empirical results of both the NIDS and Alumni data sets, providing the empirical results of a multinomial logistic regression with income as the dependent variable, and a cross-tabulation regarding income and the level of tertiary education obtained. The multinomial logistic regression results obtained from the NIDS data set indicated that higher levels of tertiary education are associated with higher income categories, while lower levels of tertiary education are associated with lower income categories. The multinomial logistic regression results obtained from the Alumni data set showed that tertiary education was not a significant factor in determining an individual's income; yet it should be noted that the Alumni data set only considered individuals who have graduated during the period 2009-2012. The cross-tabulation estimates showed that, for the NIDS data set, the level of tertiary education does have a significant and positive relationship with income; while for the Alumni data set, the results indicated that the level of tertiary education did not have a significant impact on income. From chapter 4 it became apparent that the level of tertiary education does have a significant impact on education within the NIDS sample; while for the Alumni sample it was concluded that the level of tertiary education does not have a significant impact on income within the first few years following graduation.

The following section will provide a brief summary of the contents of this study, which includes the research conducted, the findings thereof, and an indication of how the research objectives were met.

5.2 Summary

Chapter 1 provided a general introduction, describing the importance of education within economic development as well as setting the research objectives of this study. From the literature review (considered in chapter 2), it was found that education is significantly associated with income and that the rate of return to education was positive for individuals from all demographic backgrounds, yet inequality between individuals does exist. Chapter 2 also considered four different models to which the data will be applied, and it was concluded that a multinomial logistic regression model would be most suitable for the conduction of the empirical research, since this study made use of a single categorical dependent variable and several metric and categorical independent variables.

An analysis of both data sets was given in chapter 3, the raw data appeared to be in line with the relevant literature as described in chapter 2. From the analysis, it was evident that individuals with higher tertiary qualifications (master's degree and Ph.D.) were concentrated in higher income categories, while individuals with lower tertiary qualifications (bachelor's degree, bachelor's degree & diploma, and honours degree) were concentrated in lower income categories. Chapter 4 reported the empirical results from the multinomial logistic regression, as well as additional cross-tabulation results for both data sets. The multinomial logistic regression results obtained from the NIDS data set indicated that gender, marital status and the level of education were significantly associated with income for the sample. From the multinomial logistic regression results, it is apparent that lower levels of education are associated with lower income categories, while higher levels of education are associated with higher income categories for the NIDS data set. The multinomial logistic regression results obtained from the Alumni data set indicated that, within certain income categories, the variables age, province of primary employment, and occupation are significantly associated with income. From the cross-tabulation estimates, it was determined that the level of tertiary education was significantly associated with income for the NIDS data set, but not for the Alumni data set.

There were six objectives set and reached throughout this study, the first of which was placing emphasis on the value of education in general as well as the value of tertiary education specifically. This objective was reached in chapter 2, where it was found that

education is vital to economic development, poverty reduction and increasing living standards. The second objective included identifying the factors of influence considering the income of tertiary educated individuals. This objective was reached in chapters 2 and 3, where it was found that gender, age, population group, marital status, experience, occupation, location of employment, tenure, and union membership were all factors influencing the income of tertiary educated individuals. The third objective entailed the identification of the positive and significant influence of the level of tertiary education on an individual's earnings. This objective was reached in chapters 2 and 3. The fourth objective implied determining the significance of the level of tertiary education in relation income, this objective was reached in chapters 3 and 4, where it was determined that the level of tertiary education does have a significant impact on the amount of income earned. The fifth objective was to determine which factors were significantly associated with income for the two data sets, in chapter 4, it was determined that, for the NIDS data set, the variables gender, marital status and highest degree obtained were significant. While in the case of the Alumni data set, the variables age, province of primary employment and occupation were significant. The last objective was to conclude and make recommendations on the influence of tertiary education and other factor of influence on the income of individuals within South Africa as well as for the NWU's School of Economics. This objective will be reached at the conclusion of this chapter.

The following section will draw conclusions from the literature from the survey as well as from the empirical results. After which this chapter will conclude with recommendations about the optimal level of tertiary education for individuals within South Africa, as well as recommendations for future studies considering the significance of tertiary education in relation to income.

5.3 Conclusion

The primary objective of this study was to determine the significance of tertiary education in relation to income and, secondly, to identify other factors influencing a tertiary educated individual's income. This section is divided into four sub-sections, of which the first will focus on the conclusions drawn from the literature overview (chapter 2), the second will focus on the conclusions drawn from the descriptive results (chapter 3), the third sub-section will focus on the conclusions drawn from the empirical analysis

(chapter 4), while the last sub-section will provide a conclusion and a summary of the findings.

5.3.1 Conclusions from literature

The literature overview considered four different models. These were Heckman's two-stage selection model, the Double-Hurdle model (DHM), the Mincerian model, and the multinomial logistic regression model. The multinomial logistic regression model was determined to be the most appropriate model for this study, since this study made use of a single categorical dependent variable (income – with multiple categories) and several metric and categorical independent variables. The international literature discussed indicated that the returns to education (education in relation to income) decreases as the level of economic development of a country increases, which means that education is more significant in relation to income in developing countries, than in developed countries (Psacharopoulos, 1981; Psacharopoulos, 1985; Psacharopoulos & Patrinos, 2004:112). It was also found that the average rate of return to education is highest in the sub-Saharan African and Latin American region, indicating that education is more significantly associated with an individual's income in these regions than any other region. Significant literature findings on education's relation to income shows that the median wage for tertiary educated skilled workers in South Africa was estimated to be 44.63% higher than the median wage for those with only a Matric certificate (Bhorat, 2000:3).

It was found that, apart from the level of education, other variables such as gender, age, population group, occupation, location of employment, field of study, and the total years of work experience, were all found to be significant determinants of income (Bhorat, 2000; Mwabu & Schultz, 2000; Rospabe, 2001). It was concluded from the literature findings that economics as a field of study currently yields a relatively higher rate of return compared to majors such as accounting, mathematics and chemistry (Caplan, 2013). It was also found that the years of work experience as well as age delivers diminishing returns to education; males earn significantly more than females, but the gender gap becomes smaller as the level of tertiary education increases; managers and professionals have the highest significant positive influence on an individual's income, in comparison to other occupational categories; and that Gauteng and the Western Cape

were found to be associated with higher earnings in comparison to other provinces in South Africa.

5.3.2 Conclusions from descriptive results

Firstly, when considering the NIDS data set, only those individuals with a tertiary background were sourced from the National Income Dynamics Study's, 2010-2011, adult wave 2. Approximately 40% of the NIDS sample were individuals with a bachelor's degree, while the majority of the total sample individuals were female (59%), married (59%), between the ages of 36 and 55 (69%), African by population group (63%), and considered their occupational category as professional (73%). The average age for the sample was 45 and the majority of individuals worked less than 41 hours per week. Considering earnings per month before tax and general deductions, the average earnings for those individuals with a bachelor's degree were R18 217, those with a bachelor's degree and diploma earned an average of R20 933, while those with an honour's degree earned the least with an average of R17 740 per month, and those with a master's degree or Ph.D. earned the highest average of R33 968 per month.

Secondly, when considering the Alumni data set, half of the total sample individuals listed a bachelor's degree as their highest degree. Females represented 50% of the sample, while 41% were either 24 or 25. The majority of individuals were listed as never married (71%), and studied Economics and International Trade (bachelor's degree) or International Trade (postgraduate degrees) at the North-West University's School of Economics. Most individuals were not employed while studying (68%), and only had one or two years of work experience (65%). Almost half of the sample population worked less than 41 hours per week, while 47% worked in the Gauteng province and 42% earned between R10 001 and R15 000 per month, before tax and general deductions. Considering the earnings of those individuals with a bachelor's degree, 23% earned more than R20 000 per month, while only 19% of those individuals with an honour's degree and 42% of those with a master's degree or Ph.D. earned more than R20 000 per month.

From both data sets, it could be concluded that lower levels of tertiary education were associated with lower levels of income and that higher levels of tertiary education were associated with higher levels of income, yet this was not true in the case of those

individuals with an honours degree. In both data sets, those individuals with an honours degree earned within the lowest income categories.

5.3.3 Conclusions from empirical analysis

Firstly, considering the NDIS data set, the variables, age, population group, occupation and average weekly work hours were eliminated from the Multinomial logistic regression model for the NIDS data set, since these variables either resulted in missing cases being reported or that these variables suffered from multicollinearity, or both. Considering the first income category (R1 – R13 000), only gender, marital status and the highest degree obtained were significant within certain categories; while in the case of the second income category (R13 001 – R22 000), only the variables gender and the highest degree obtained were significant. The parameter estimates of the model indicated that males are more likely to earn a wage within higher income categories than their female counterparts, while married individuals are also more likely to earn a wage within higher income categories than individuals from other marital status categories. It was also found that the level of tertiary education played a positive and significant role in the level of income earned.

The cross-tabulation results reported that higher levels of education are associated with higher income categories, while lower levels of education are associated with lower income categories. This result was found to be true for all cases apart from those with an honours degree, which were associated with similar income categories to those with a bachelor's degree. Both the multinomial logistic regression model and the cross-tabulation estimates were significant according to their relevant chi-square values.

Secondly, considering the Alumni data set, only certain categories within the variables age, occupation, and province of primary employment were significant according to estimates drawn from the multinomial logistic regression results. The parameter estimates obtained from the model indicated that younger individuals are more likely to earn within lower income categories than older individuals, who are more likely to earn within higher income categories. The results also indicated that those individuals who are employed in the Gauteng province are more likely to earn within higher income categories than individuals from other provinces. Furthermore, it was also reported that individuals who listed their occupations under general management, operations, accounting, analyst, logistics, or marketing were more likely to earn within the third

income category than other occupations, yet these occupations were less likely to earn within the highest income category compared to other occupations. The significance of the likelihood ratio chi-square statistic of the multinomial logistic regression indicated that the model was feasible.

The cross-tabulation estimates for the Alumni data set proved to be insignificant, indicating that the level of tertiary education was not significantly associated with the level of income earned for the sample individuals. Yet, this result was expected to some extent, considering that the Alumni data set consisted only of individuals who have graduated during the period 2009-2012. Since the cross-tabulation estimates proved to be insignificant, as well as the fact that the level of tertiary education was not significant within the multinomial logistic regression model, it can therefore be concluded that the level of tertiary education did not play a significant role within the first four years of graduation for the Alumni data sample.

5.3.4 Conclusion and summary of findings

The first data set considered was the NIDS data set. It was determined from the multinomial logistic regression model that males are more likely to earn within higher income categories than their female counterparts, this finding corresponds with relevant literature stating that males are more likely to earn higher earnings than females, including higher rate of returns to education (Rospabe 2001; Psacharopoulos & Patrinos, 2004). It was also found that married individuals earn within higher income categories than individuals from other marital categories, where this finding is supported by literature expressing that married individuals earn significantly more than individuals who are not married (Rospabe, 2001:7).

The primary objective of this study was to determine whether the level of tertiary education has a significant influence on income. It was found that each level of tertiary education had a significant relationship with income and that the higher levels of education are associated with higher income categories. Those individuals with an honours degree earned within lower income categories which did not seem to correspond with the relevant literature, while individuals with a master's degree or Ph.D. earned within higher income categories, and those with a bachelor's degree or a bachelor's degree and a diploma earned within lower income categories. The income categories associated with all degrees except for an honours degree are in line with the

relevant literature, where each level of tertiary education obtained would correspond with higher earnings (Mincer, 1958; Butter, 1966; Borland, 2002; Qian & Smyth, 2008).

The second data set considered was the Alumni data set. It was determined from the multinomial logistic regression model that younger individuals were more likely to be associated with lower income categories, while older individuals were more likely to be associated with higher income categories. This means that age is positively associated with an individual's earnings, which corresponds with the relevant literature (Reed & Miller, 1970; Kabubo-Mariara, 2003). The findings also indicated that those who listed their occupations within the field of logistics and marketing were more likely to earn between R10 001 and R15 000, while those who listed their occupations within the field of general management, operations, accounting or analyst, were more likely to earn between R15 001 and R20 000. Other occupations were more likely to earn within higher income categories in relation to the mentioned occupational categories. The province of primary employment was also found to be a significant factor of influence, where the Gauteng province was found to be the only significant provincial category and was also associated with higher income categories. The finding that the Gauteng province has a significant and positive influence on a tertiary educated individual's earnings, corresponds with the findings of Bhorat (2000) and contradicts the findings of Rospabe (2001), who found that living in any other province besides the Western Cape will decrease an individual's chances of receiving a higher wage.

The following section will conclude with recommendations for future studies considering the significance of tertiary education in relation to income.

5.4 Recommendations

Due to the lack of resources, occupational and demographic data of South African tertiary educated individuals, only a small sample could be sourced for the completion of this study. A larger sample size would have reduced the number of variables which were eliminated due to missing cases being reported. While in the case of the Alumni data set, the level of tertiary education proved to be insignificant within the first four years of graduation and, as such, calls for a sample which considers individuals from a longer graduation period. Future studies should thus consider a larger sample size as well as considering individuals from a longer graduation period.

The finding that individuals with an honours degree earn within lower income categories than other tertiary degrees within both data sets requires further investigation since this finding could not be explained with confidence. This was also the first study conducted on the factors of influence and the significance of the level of tertiary education in relation to income, for individuals who have graduated from the North-West University's School of Economics. Consequently a number of suggestions on ways in which this study could assist to improve future studies are listed below:

- Future studies should consider larger sample sizes when studying the income of tertiary educated individuals. Due to the small sample size, the majority of variables from the NIDS data set reported to have missing cases within certain income categories, while the majority of variables from the Alumni data set proved to be insignificant.
- The Alumni sample only considered individuals who have graduated during the period 2009-2012. As a result, the level of tertiary education obtained was not significantly associated with earnings received. Future studies should thus consider a sample of individuals from a longer graduation period, since the level of tertiary education could only prove to be a significant factor after many years of graduation.
- The Alumni questionnaire only considered income categories, and did not consider asking individuals for their actual monthly income due to anticipating the rejection of the questionnaire by respondents. Future studies should thus consider the actual income amount and not income as a categorical variable, since this will ease the estimation of the model and the interpretation thereof.

Tertiary educated individuals should consider obtaining a master's degree or Ph.D., since both the literature and empirical findings indicated that these degrees earn within higher income categories compared to other tertiary degrees. Findings from this study also indicated that married individuals and those who are employed in the Gauteng province earn within higher income categories. Those who listed their occupations under general management, operations, accounting or analyst, earned within the second highest income category. Since these variables are not considered to be fixed in nature, it could be of some assistance for individuals who have recently graduated and are currently considering employment opportunities. Yet, the fact that higher education renders higher income for the individual who has invested in their academic career, and that education is a vital component in economic development cannot be understated.

Annexure: Alumni questionnaire

North-West University, School of Economics Alumni questionnaire

Question 1	What is your year of birth?
Answer:	
Question 2	Gender?
1	Male
2	Female
Question 3	Population group?
1	African
2	White
3	Coloured
4	Indian
5	Asian
Question 4	Marital status?
1	Married
2	Living with partner
3	Widow/Widower
4	Divorced or separated
5	Never married
Question 5	What is your highest completed level of education?
1	Bachelor's degree
2	Honours degree
3	Master's degree or Ph.D.
Question 6	In what year did you matriculate?
Answer:	
Question 7	Were you employed whilst completing you relevant degree?
1	Yes
2	No
Question 8	What is your total years of work experience?
Answer:	
Question 9	What is your current primary occupation?
1	Accounting
2	Analyst
3	Banking
4	Education
5	Finance
6	General Management

7	Insurance
8	Logistics
9	Marketing
10	Operations
11	Self employed
12	Student
13	Unemployed
14	Other

Question 10	What is your average work week hours? E.g. 40 hours a week
Answer:	

Question 11	In which province is your primary employment located?
1	Gauteng
2	Eastern Cape
3	Free State
4	KwaZulu-Natal
5	Limpopo
6	Mpumalanga
7	Northern Cape
8	North-West
9	Western Cape
10	Outside South Africa

Question 12	Please select the appropriate current Monthly income bracket (Before tax and general deductions)
1	R 0
2	R1 - R1 000
3	R1 001 - R5 000
4	R5 001 - R7 500
5	R7 501 - R10 000
6	R10 001 - R12 500
7	R12 501 - R15 000
8	R15 001 - R17 500
9	R17 501 - R20 000
10	R20 001 - R25 000
11	R25 001 - R30 000
12	R30 001 - R40 000
13	R40 001 - R50 000
14	>R50 000

Question 13	Would you like a copy of the final dissertation upon its completion? If yes, please provide your email address below.
Answer:	