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Perceived Quality Matters: Increased returns to University education (0638)

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Highly unequal South Africa is grappling with funding tertiary education. Against a backdrop of limited resources, public universities require state funding to remain financially viable and employers need graduates who can quickly provide the requisite skillset. Graduates want the assurance that they are employable. Social networks and stratification differ across tertiary institutions in South Africa. This paper utilises data from a tracer study of graduates from Rhodes University (RU) and the University of Fort Hare (UFH) representing institutions at the opposite end of the perceived institutional quality spectrum, employing a Heckman selection to predict the returns to education. RU students earn 21% more than UFH students supporting the notion that perceived quality of the university attended is the decisive factor for earnings. Notwithstanding that, UFH graduates also get positive returns through education confirming that government should better direct its limited resources to quality schooling and tertiary education institutions to ensure overall better returns.

Keywords: University education returns; heterogeneity; tertiary education earnings.

Introduction

Public funding for universities is limited, employers are questioning the calibre of graduates and fee providers face affordability pressure. In 2015, the South African higher education sector was the focus of student protest and unrest under the banner of #Feesmustfall (Research and Policy, 2016). This study compares graduate earnings considering the graduates'

school, institution, field of study, gender and population group, focusing on the link between the perceived quality of institution and earnings. The results show that the decisive factor for earnings per discipline is not schooling but the perceived quality of the university attended.

This work is significant because polarity is magnified in South Africa where socio-economic differences are extreme and perceived institutional quality differs markedly. Bhorat and Mayet (2012) found race, gender and field of study to be determinants of graduate earnings in South Africa, and Koen (2006) as well as Rogan and Reynolds (2016) found socio-economic status significantly linked to labour market success (Van Den Berg et. al., 2011).

Mincer (1974), one of the Human Capital Theory pioneers had the view that schooling causally affects earnings across the population in a homogenous manner. Tsai and Xie (2011) believe those who benefit the most from attending tertiary institutions are those who attend quality schools. Sorting gains, referring to a relationship between years of schooling, and the return to a unit of schooling, is allowed to vary for different graduates (Henderson, Polachek and Wang, 2011; Keane and Wolpin, 1997) and across multiple outcomes including social and health benefits (Heckman, Humphries and Veramendi, 2017). Marginson (2017) considers human capital theory to be unrealistic and the sharp discontinuity of the top income levels is difficult to explain (Piketty, 2014).

Earnings and education literature in South Africa

South Africa is one of the most consistently unequal societies in the world; its Gini coefficient ranges from 0.66 to 0.69 (Statistics South Africa, 2017) and its unemployment rate is ranked as the worst (International Institute for Management Development, 2016). The relationship between poor

schooling and lower earnings produces high inequality in South Africa (Case and Deaton, 1999; Lam, 1999; Van Den Berg, 2015). Eighty per cent (80%) of inequality is driven by wages linked to education (Van der Berg et. al., 2011) and a skilled worker shortage (Bhorat, Cassim and Tseng, 2016). Early intervention childhood programmes are often missing (Cunha and Heckman, 2007). Poorer pupils are denied access to university in the first instance, and when they do access university, are less prepared (Allais, 2017).

South African state schools are divided into five quintiles according to the wealth of their surrounding communities, with the first quintile being the poorest and the fifth quintile the wealthiest (Van der Berg, 2015). Van der Berg (2015) found that students are no longer aligned to the cognitive requirement of the grade, measured through Annual National Assessments, and access to higher education is predetermined from as early as Grade 4 (Van der Berg, 2015). Over 80% of those who qualify for a degree entrance pass, come from quintile 4 and 5 schools (Van der Berg, 2015). Moses (2011) states that the capability of schools between the higher and lower quintiles differ markedly in their capability to impart cognitive skills.

For those not in employment, education or training (NEETs), the age group between 15 and 24 was found to have an unemployment figure of 30% (Statistics South Africa, 2017), ascribed to low schooling as well as institution quality (Sheppard and Cloete, 2009). South African has a small proportion of college students as opposed to university students (Van der Berg, 2015). South Africa classifies its higher education institutions into Historically Disadvantaged Institutions (HDIs) and Historically Advantaged Institutions (HAIs). Bhorat and Mayet (2012) as well as Branson et. al. (2015) found that the quality of a higher education institution crucially

constrains finding employment. During the apartheid era HDIs received significantly less funding and resources with the result that all the leading research institutions are HAIs. Van Broekhuizen and Van der Berg (2013) stated that around 75% of black graduates graduate from HDIs. This paper strives to make a contribution by focussing on the differences in graduate earnings in terms of perceived university quality.

Methodology

The study is based on an analysis of data gathered by Rogan and Reynolds (2016) who traced 1211 graduates from two South African universities. They graduated in 2010 or 2011 with a third or fourth year bachelors' degree. The first, Rhodes University (n=461), is an example of an HAI and the second, UFH (n=742), in many ways, typical of an HDI. Response rates of 39% and 47% respectively were achieved from the two universities.

Recognising the interdependency between schooling, institutional quality and field of study, a Heckman selection was used to, firstly, sort employed graduates by school type and institution to estimate the probability of employment. Thereafter, including the latter as a right-hand side variable, it was examined whether earnings can be predicted using population group, gender and field of study:

$$Y1(\text{Employability Success}) = \alpha 0 + \alpha 1(X1[\text{Type of School}] + X2[\text{Institution}]) + \varepsilon 1$$

$$Y2(\text{Earnings Premium}) = \beta 0 + \beta 1 Y1 + \beta 2\ (X3\ [\text{Field of Study}] + X\ 4[\text{Gender}] + X\ 5[\text{Population Group}]) + \varepsilon 2$$

Y1 and Y2 are endogenous (dependent variables) and X1 through X5 are independent variables; ε1 and ε2 are the error terms.

A diagram of the proposed earnings model is depicted below (Figure 1).

Figure 1 Diagram of proposed Earnings Model.

Results

Descriptive analyses of monthly earnings differences, run individually for each variable, are presented in Table 1 and Table 2 below. The differences between earnings of a RU versus a UFH graduate are more than 21% with RU earning significantly more than students from UFH. The average earnings of SET and commerce graduates are significantly higher than for humanities graduates.

Table 1: Mean monthly earnings in Rands

Group	N	Category	Mean	Std Dev	P.z
Schooling X1	**754**	Public School Elite	17,858	*564*	
		Public School Low Cost	**15,514**	*530*	0.004**
		Private Elite	**21,055**	*1,095*	0.004**
		Private Low Cost	14,671	*1,212*	0.29
University X2	**846**	UFH	**15,397**	*409*	0.000***
		RU	19,457	*553*	
Field of Study X3	**846**	SET	18,557	*933*	
		Commerce	18,259	*682*	0.775
		Education	17,266	*980*	0.386
		Humanities	**15,894**	*448*	0.005**
Gender X4	**846**	Male	18,202	*581*	
		Female	**16,310**	*407*	0.003**
Population Group X5	**846**	**846**	16,037	*400*	
		Coloured	15,718	*2,187*	0.876
		Indian or Asian	**26,865**	2,715	0.000***
		White	**19,046**	*631*	0.000***

Notes: *** Significance at 1%, ** Significance at 5%, * Significance at 10%

High standard deviations were found for private elite, private low cost, Coloured and Indian or Asian groups, so care must be taken in interpreting these categories.

Table 2: Nominal mean monthly earnings in Rands, by university

Group	N	Variable	UFH	RU
Schooling X1	**754**	Public School Elite	16,025	18,938
		Public School Low Cost	14,918	18,633
		Private Elite	17,689	21,711
		Private Low Cost	13,077	18,077
University X2	**846**		15,397	19,457
Field of Study X3		SET	16,219	20,861
		Commerce	15,899	22,152
		Education	17,261	17,421
		Humanities	14,484	17,534
Gender X4	**846**	Male	16,025	21,753
		Female	14,918	18,084
Population Group X5	**846**	Black African	15,032	19,760
		Coloured	14,406	17,694
		Indian or Asian	38,400	24,633
		White	19,575	18,977

Notes: *** Significance at 1%, ** Significance at 5%, * Significance at 10%

Following this the Heckman selection model was run to predict whether students would be in the employed group or not, and thereafter their earnings, using the type of school and university they attended as predictors for the 752 students who indicated their schooling information.

Table 3: Earnings equation N = 752

Group	Category	Coefficients	P.z
Schooling X1	Public School Low Cost	-.2284659	0.035**
	Private Elite	-.2833815	0.051*
	Private Low Cost	-.3110054	0.074*
University X2	UFH	-4000659	0.000***
Field of Study X3	Commerce	370.5366	0.726
	Education	98.04327	0.955
	Humanities	-1897.14	0.052*
Gender X4	Male	1943.2	0.008***
Population Group X5	Coloured	1373.495	0.501
	Indian or Asian	8744.648	0.000***
	White	0.0652*	0.0652*
Institution	UFH	0.000***	0.000***
	Lambda	0.012**	0.012**
	Number Observed	752	752
	Rho	-0.96868	-0.96868

Group	Category	Coefficients	P.z
	Sigma	12441.53	12441.53
	Wald Chi2(7)	38.01	38.01

Notes: *** Significance at 1%, ** Significance at 5%, * Significance at 10%

The monthly wages were estimated from the bracket estimates provided in the dataset where no exact amount was provided. The results suggest that perceived quality of institution influences earnings, with students from UFH (HBI) earning significantly less than their counterparts from RU (HWI).

Implications of Study

Rogan and Reynolds (2016) reported graduate unemployment and lower earnings to be linked to the UFH students who are more likely to have attended low quintile schools, and recommended that interventions for students be aimed at these schools, especially during the foundation phase (Van der Berg, 2015). In terms of the University Ranking by Academic Performance (URAP 2017), RU is ninth in the country and 997th in the world compared to the UFH which is placed 17 out of the 18 universities listed in South Africa and 2273 in the world. Rankings measure what is easily measured and would not take into consideration that UFH might be achieving laudable outcomes in relation to the resources that they have.

Certain students are benefitting more from education than others (Tsai and Xie, 2011; Borgen, 2015). Belgium places a high premium on signalling and Cyprus a low one (Van der Velden and Bijlsma, 2016). Students from higher quality institutions earn more as a result of signalling (Arum and Rokstra, 2014), employer's perceptions (Pauw et. al., 2006) or networking (Kraak, 2012). RU graduates earned more than UFH for every category, especially in humanities where the difference was 17.4%.

Limitations

A limitation of the study relates to selection bias as those who responded were perhaps more contactable due to being employed. The self-reported data may also have an element of unreliability. More universities and all fields of study should be included in future. In terms of the cohort effect, graduates may have been scarce at the time. Panel data have been found to be far more effective in determining earnings as earnings may differ across the lifecycle. Additionally, public sector employment may initially yield better returns, but overtaken by private sector returns in the long term.

Conclusion

This study sought to establish whether graduates from perceived quality institutions earn more in the South African context. It found that graduates from RU earn more than those from UFH. The government should invest in better schooling, specifically in the foundation phase, and invest in universities, as this would ensure more tax revenues from a bigger pool of graduates. Also if, as per the Heher report, only 7% of black students were passing in 2014 then interventions such as a four year degree, should be implemented (Scott, 2016).

Heckman, Humphries and Veramendi (2017) conclude that graduating from a tertiary institution is not a wise decision across the board, as people sort into schooling based on their realised incremental returns, disaggregated by level of schooling. However, education provides wider social and health returns (Oreopoulos and Salvanes, 2011; Furnee, Groot and Van Den Brink, 2008; Avery and Turner, 2012 and Haveman and Wolf,1984), and greater participation in the economy, (Taskinsoy, 2012),

resulting in economic growth (Valero and Van Reenen, 2016). Universities have a third mission of contributing to society (Veugelers, 2016).

This paper employed a Heckman selection and questions the validity of the linear nature of the human capital theory, while recognising the heterogeneity of the returns. It acknowledges that this excludes the social benefits of education, as well as there being other forms of capital besides human capital at play. The model is partially successful (38%) at predicting a student's earnings. RU students earn 21% more than UFH students in the descriptive analysis. Regardless of this, it makes good sense from a macro-economic perspective to attract all qualifying students to tertiary education. A degree in itself is not a passport to equalising society. All stakeholders have a joint responsibility to keeping the doors of opportunity open to all (Crawford et. al., 2016). Current South African tertiary education policy may be dis-equalising our society.

Disclosure statement

No potential conflict of interest was reported by the authors.

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