

The Impact of Students Financial Aid on Demand for Higher Education in South Africa: An Econometric Approach

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Abstract

University is paramount in producing graduates who can think critically and who can solve problems. The study investigates the impact of student's financial aid to higher education enrolment. The focus is on the national financial aid scheme, which is directed towards the disadvantaged students enrolling in higher education. The main aim of the student financial aid is to increase the enrolment in higher education and to bring about equity in higher education. The study uses data from National student financial aid scheme (NSFAS) to determine its impact on higher education enrolment. The study employs the bounds testing cointegration approach. The motivation to adopt this methodology was based on the fact that the data used in this study is finite. These results reveal a long run relationship between student enrolment at higher education and student financial aid.

Keywords: Higher education; financial aid; Cointegration; South Africa

1. Introduction

Higher education has a responsibility above and beyond its core mandate of teaching, research and community outreach. Higher Education of South Africa (HESA) (2008) in studies duplicated by both mature and emerging economies, explains that the role of the University is paramount in producing graduates who can think critically and who can solve problems. Education in South Africa can be divided into two phases namely: pre-apartheid and post-apartheid era. This study concentrates at most on the post-apartheid era, that is the era after the abolishment of apartheid and a democratic government put in place in 1994. The inception of the new government brought about many changes in the education system. Access to universities is made easier by providing financial aid in higher education for all irrespective of color or gender, equity and enrolment issues are also addressed. Scholars such as Bevia and Iturbe-Ormaetse (2002) and Hauptman (1998) find that in most countries the cost of higher education is financed mainly by the government. In the same vein, Bevia and Iturbe-Ormaetse (2002) assert that in Spain in 1996, 20% of the total cost is covered by students and 80% is covered by state transfers.

To address challenges of higher cost, access and equity in higher education, during the year 1991 the south African Government established the Tertiary Education Fund of South Africa (TEFSA). This organisation was established as a non-profit making institution to provide higher education students with financial aid. Later in 1995 National Student Financial Aid Scheme (NSFAS) was established and the scheme is administered by TEFSA. In the year 2000 TEFSA name changed to National Student Financial Aid Scheme (NSFAS). Government provide financial aid to students in higher education in the form of loans and bursaries, currently NSFAS loans ranges from R14 000 minimum to R46 000 maximum. According to Ministry of education in 2001 its priority is to increase the participation rate in higher education and to broaden social base of higher education by increasing access to higher education for workers and professionals in pursuit of multi-skilling, re-skilling and for adult learners who were denied access in the past. The NSFAS is one of the most successful schemes. According to Jackson (2002) ten years after the scheme was established, South Africa is proud to speak of a student scheme that has made 587 000 awards to disadvantaged students, 99% of whom are black.

Education is the foundation of economic development of the country, while development is one of the ideals of all countries in the world. Governments in the most countries around are under pressure, trying to find the best solutions of

assisting students in higher education. The South African government spend millions of rand per annum in financial aid to students in higher education, hoping to balance the imbalance of black and whites graduates caused by the apartheid government and the education system. The imbalances on the one hand resulted in the majority of being poor and most of the black students were unable to enrol in university due to lack of funds. On the other hand the results of imbalances were favourable to whites hence many of them are financially well off and have majority of graduates. Jackson (2002) asserts that mission of the financial aid scheme is unashamedly socio-political. Hence, the establishment of financial aid scheme to assists the majority of disadvantaged students are imperative.

The main aim of this study is to establish the impact of student financial aid to the enrolment in South African higher education, and to determine whether financial aid addresses equity in higher education. The importance of this study is to assist policy makers in making informed decisions concerning government financial aid for students in higher education. Also provide policy makers with the results that inform them about effectiveness of financial aid. The remainder of the paper is as follows: Section 2 presents literature survey, where Section 3 describes the research methods and data description. Section 4 explains ARDL model specification, followed by bounds testing procedure. Section 5 present results and discussion, followed by conclusion.

Literature Survey

The theory helps to explain the interdependence that exists between education and human capital. Human capital theory refers to the stock and knowledge embodied in the ability to perform labour so as to produce economic value. Begg, Fisher and Dornbusch (1991) define human capital as the stock of expertise accumulated by a worker. It is valued for income-earned potential in the future. Scholtz (1992) defines human capital investments as enrolment rates multiplied by the cost of education for one individual. Lucas (1988) measures human capital probably by expenditure on education and "external" human capital, which he believes to be able to measure by calculating the returns to land. According to Firtzsimons (1999) through Western countries, education has recently been re-theorised under human capital theory.

Frank and Bernanke (2001) state that well educated workers more productive than unskilled labour, government in most countries try to increase the human capital of their citizens by supporting education. Countries such as the United States of America (USA) provide support by providing public education in secondary school and provide grants in higher education. However, there are arguments that subsidised education is the private demand curve for an educational service that does not include all the social benefits of education. Another argument is that poor people might like to invest in human capital but are unable to do so because of financial constraints. Banya and Elu (2001) argue that education provides the catalysts for economic, social and political development in the region and this is commonly referred as the "human capital theory".

The need for students' financial aid in higher education is a serious problem in both developed and developing countries. Scholars such as Winter-Ebmer and Wirz (2002) have conducted investigation on financial aid and enrolment in higher education in Europe. Their study claim that government spent considerably amounts of money in financial aid for higher education students. Also their study provides evidence for the impact of financial aid on enrolment of students in higher education. Their studies used a panel of European countries and an economic model with data from fourteen countries.

Researchers such as Ziderman (2005), Long (2003) and Banya and Elu (2001) argue that financial aid to higher education students increase enrolment and address the equity question in higher education. However, Bevia and Iturbe-Ormatxe (2002) differ in opinion and regard subsidising of higher education as an unfair practice, funds that government uses are from taxes that it collects from all citizens. Bevia and Iturbe-Ormatxe (2002) further proclaim that financial aid for higher education implies financing an activity that provides direct benefits only to the privileged minority because majoring of students enrolled in higher education are from middle class and high class.

Higher education in Sub-Sahara is faced with high enrolment and high cost per unit. Banya and Elu (2001) tested whether there is any relationship between enrolments and units cost. A simple regression analysis for 11 Sub-Sahara countries was developed. The results indicated that there appears to be no statistical relationship between the actual unit cost and enrolment. However, Vossesteyn (2004) argues that with government financial resource limited more emphasis is placed in cost sharing to meet the growing demand for higher education with special reference to countries having a longstanding tradition of students' loans e.g. Australia, Canada and the USA. The study explores some principles of how students can be supported and who must receive the financial aid. The findings are that student support is primary targeted at increasing access to higher education and is expected that the financial aid must address students from disadvantaged background.

Research Method and Data description

This section discuss in detail the research methodology used in this paper, the driving force of the study is the impact of financial aid to enrolment. Student financial aid is intended to reduce the cost of higher education institutions for the disadvantages students in higher education. The study uses data from National Department of education. The national student financial aid scheme (NSFAS) is established in 1996 where previously it was TEFSA. The data for enrollment is collected annually by the department of education from all higher institutions in South Africa for period (1991-2010). The data in use is a secondary data from various annual reports of the department of education and Council for higher education (CHE).

An important aspect pertaining to time series data is whether each variable is stationary in levels or stationary after first differencing. Classical regression via ordinary least squares (OLS) estimation may yield spurious relationships and are therefore inappropriate if the series are non-stationary. The Augmented Dickey-Fuller (ADF, 1979) test is used for the estimation of individual time series with intention to provide evidence about when the variables are integrated. In the second step, the Bounds cointegration approach is carried out to determine the long run equilibrium relationship holds with the variables under investigation.

ARDL Model Specification

To empirically analyse the long-run relationship between student financial aid and student enrolment the model has been estimated using the bounds testing cointegration procedure developed by Pesaran, Shin and Smith (2001). The technique is adopted based on the following validities: firstly, the test procedure is simple, as opposed to other cointegration test such as Johansen cointegration test, it allows the long-run equilibrium be established via OLS once the lag order of the model is identified. Secondly, the bounds test allows a mixture of I(0) and I(1) variables as regressors, that is the order of integration of appropriate variables may not necessarily be the same. Lastly, this procedure is suitable for small or finite sample size.

Following Pesaran *et al* (2001), this study assemble the vector autoregression (VAR) of order p , denoted VAR (p), for the following student enrolment function:

$$Z_t = \mu + \sum_{i=1}^p \beta z_{t-1} + \varepsilon_t \quad (1)$$

Where Z_t is the vector of both X' and Y' , where y is an endogenous variable defined as student financial aid (ENR), X_t is the vector matrix which represents a set of explanatory variables, that is, student financial aid (SFA) and t is a time or trend variable.

According to Pesaran *et al* (2001), yt must be I(1) variable, but the independent variable X_t can be either I(0) or I(1). The study further develops a vector error correction model (VECM) as follows:

$$Z_t = \mu + \alpha t + \delta z_{t-1} + \sum_{i=1}^p \gamma \Delta y_{t-1} + \sum_{i=1}^p x \Delta x_{t-1} + \varepsilon_t \quad (2)$$

Where Δ is the first difference operator, the long run multiplier matrix δ as the diagonal elements of the unrestricted matrix so that the selected series can be either I(0) or I(1). On the basis of equation (2), the unrestricted VECM of interest can be specified as:

$$\Delta \ln ENR_t = \mu + \delta_1 \ln ENR_{t-1} + \delta_2 \ln SFA_{t-1} + \sum_{i=1}^p \theta \Delta \ln ENR_{t-1} + \sum_{i=1}^p \varphi \Delta \ln SFA_{t-1} + \varepsilon_t \quad (3)$$

Where Δ is the first difference operator and ε_t is a white noise distribution term. ENR is the student enrolment in higher education and SFA is the student financial aid.

1.1 Bounds testing procedure:

The first step in the bounds testing approach is to estimate equation (3) by OLS in order to test the existence of a long run relationship among the variables under study. The test uses an F-test for the significance of the coefficients of the lagged levels of the variables. The null and alternative hypothesis is as follows:

$$H_0 = \beta_1 = \beta_2 = 0 \quad [\text{No long run relationship}] \text{ against the alternative}$$

$$H_1 = \beta_1 = \beta_2 \neq 0 \quad [\text{Long run relationship exist}]$$

The computed F-statistics value will be evaluated with the critical values. If the F-statistics is above the upper critical value, the null hypothesis of no long run relationship can be rejected irrespective of the orders of integration for the time series. Conversely, if the test statistics falls below the lower critical value the null hypothesis cannot be rejected. Lastly, if the statistics falls between the lower and upper critical values, the results are inconclusive.

Results and Discussion

Before the study proceeded with the bounds testing, the paper test for stationarity state of all the variables to determine their order of integration. This process is to ensure that the variables are not I(2) stationarity so to avoid spurious findings. The literature proclaims that in the presence of I(2), the results of bounds are not valid because the test assumes the presence of variables I(1) and I(0). The study applies ADF unit root testing. Table 1 reports all the results of ADF in this study.

Table 1: ADF results at levels and first difference

Variables		ADF Model	ADF Statistics	Decision
ENR	Levels	Trend + Constant Constant	-1.822 -0.126	Non-stationary Non-Stationary
	First levels	Trend + Constant Constant	-2.852 -3.224**	Non-stationary Stationary
SFA	Levels	Trend + Constant Constant	1.457 2.903	Non-stationary Non-stationary
	First levels	Trend + Constant Constant	-3.368* -2.0.13	Stationary Non-stationary

Notes: ¹ the lag length is specified using the Schwarz information criterion (SIC). ADF test statistics and significance level: * = 10 %, * = 5%, ** 1%=***.

The results indicate that the null hypothesis of non-stationarity cannot be rejected for any variables in level form. However, the variables in first differences, under the same assumption of trend + constant and constant, most of the variables become stationary at 5 and 10 percent level of significance. The second step is to test for cointegration among these two variables using bounds testing approach. The lag length of the level vector autoregression system has been determined by minimizing the Akaike Information Criterion (AIC).

Table 2: Bounds Test for Cointegration Analysis

Critical Value	Lower Bound Value	Upper Bound Value
1%	5.15	6.36
5%	3.79	4.85
10%	3.17	4.14

Note: Computed F-statistics: 6.14 (Significant at 0.05). Critical values are cited from Pesaran et al (2001), Table C1 (iii), Case 111: Unrestricted intercept and no trend.

In table 2 above the results of bounds cointegration test are presented, the study finds that the computed F-statistics for this study is 6.14 which is higher than the upper bound critical value of 4.85 at 5% level. This implies that the null hypothesis of no cointegrating long-run relationship can be rejected. These results reveal a long run relationship between student enrolment at higher education and student financial aid. Once the study established that there is a long run cointegration relationship existed, the long run coefficients need to be interpreted. See table 3 below.

Table 3: Estimated long run coefficients using ADRL approach

Variable	Coefficient	Std. error	t-statistics
LOG_SFA	0.151384	0.035276	4.291435***
C	11.23778	0.462491	24.29840

*** (**) denotes 1%(5%) significance level.

The estimated coefficient of the steady state equilibrium shows that student financial aid (SFA) has a positive impact on student enrolment on higher education. The coefficient also shows that it is significant at 1% significant level. This implies that a 1% increase in student financial aid leads to approximately 0.15% increase in student enrolment in higher education in South Africa.

Conclusion

This paper has estimated the impact of student financial aid on demand for higher education in South Africa by using time series data from 1991-2010. The study employs the bounds testing cointegration approach. The motivation to adopt this methodology was based on the fact that the data used in this study is finite. The finding demonstrates that in the long run student financial aid do increase enrolment for higher education. It is evident that higher education enrolment is sensitive to changes in student financial aid. Therefore, the South African government should realised effective higher education financing policies in order to continuously increase enrolment in higher education.

References

- Banya K. and Elu J. (2001) "The World Bank and the Financing Higher Education in Sub-Saharan Africa, Higher Education, Vol 42, no 1, pp 1-34
- Begg D, Fisher S. and Dornbusch R. (1991) "Economics 3rd edition, McGraw-Hill Book Company, pp 198.
- Bevia C. and Iturbe-Ormaetxe I. (2002) "Redistribution and Subsidies for Higher Education. The Scandinavian Journal of Economics.
- Dickey, D. and W. Fuller (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root, Journal of the American Statistical Association, 74, pp 427-431.
- Firtzsimons P. (1999) "Human Capital Theory and Education, University of Auckland.
- Frank R. and Bernanke B. (2001) "Policies to increase Human Capital", Principles of Economics, McGraw-Hill Irwin, pp 532-533
- Hauptman A. (1998) "Accommodating the growing demand for higher education in Brazil: A role for Federal University, The World Bank. Latin American and Caribbean Regional office.
- HESA (2008) "Address to the Parliament Portfolio Committee on education" 24 June 2008, Pretoria. Portfolio Committee on education.
- Jackson R. (2002) "The National Financial Student Financial Aid Scheme of South Africa (NSFAS): How and why it works, The Journal of Education, Vol.11, no 1.
- Lucas R.E. (1988) "On the Mechanic of Economic Development: Journal of Monetary Economics 22 (1988), pp 3-42.
- Pesaran, M. H., Shin Y. and Smith R. J.(2001) "Bounds testing approaches to the analysis of level relationships". Journal of Applied Econometrics, Vol. 16, pp. 289-326. ISSN 0883-7252.
- Scholtz P.T (1992) "The Role of Education and Human Capital in Economic Development: An Empirical Assessment, paper presented at the conference on Economic Growth in the World Economy, Institute fur Weltwirtschaft, Kiel.
- Vossensteyn H. (2004) "Subsidising Students, Families or Graduates? CHEPS, University Of Twente, Netherlands.
- Winter-Ebmer R. and Wirtz A. (2002) "Public Funding and Enrolment into Higher Education in Europe, Institute for the study of labour (IZA) in Bonn.
- Ziderman A. (2005) "Increasing Accessibility to Higher Education: A role for Student loans, Independence Institute for Social Policy, Moscow

