OPTIMIZING THE ECONOMIC BENEFITS OF PUBLIC SPENDING FROM NATIONAL YOUTH DEVELOPMENT AGENCY GRANT FUNDING

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ABSTRACT

This study examined the economic benefits of the National Youth Development Agency (NYDA) grant funding, in the Eastern Cape, using cost benefit analysis (CBA) and least absolute deviation (LAD) regression analysis on a sample size of 253 respondents. The study found that public investment towards youth entrepreneurship through NYDA grant funding yields positive social returns. The study further found that the development of youth entrepreneurship should go beyond just NYDA grant funding to include favorable policies towards closing gender gaps, supportive education systems as well ensuring diverse economic sectors.

1. INTRODUCTION

Welfare maximization is an ultimate objective for governments, therefore economists are constantly attempting to find ways of optimizing welfare benefits based on the rational allocation of total resources in and amongst members of society as well as the redistribution of wealth through taxation and legislation (Irshad, 2016, p.1). For this reason, this study focuses on assessing whether government spending through the National Youth Development Agency (NYDA) grant funding, in the Eastern Cape province of South Africa, has been favorable.

The NYDA grant funding came into effect in 2013 and is specifically designed to provide young South African entrepreneurs with an opportunity to access both financial and non-financial business support to establish or expand their

businesses. The NYDA grant funding uses governmental resources that are scarce and subject to opportunity costs, whose alternatives are often forgone, in favor of supporting the NYDA mandate. Over a period of 7 years (2013-2019) the NYDA has also disbursed grants to youth enterprises and cooperatives across the country, to the value of about R204.5 million. Given the large amount of public funds invested through the NYDA grant funding, it was important to assess whether this investment had favorable` social benefits.

More importantly is that since the inception of NYDA grant funding its economic impact has not previously been measured or assessed. As such, there has not been any scientific basis to justify NYDA grant funding before the commencement of this current work. In this way, the study contributes to the existing body of knowledge in the discipline of welfare economics by, for the first time, scientifically measuring public funds flowing to the NYDA mandate.

2. THEORECTICAL FRAMEWORK

Welfare economics, as a field, offers the theocratical framework used in public economics to better aid collective decision-making, design public policies, and make social evaluations (Baujard, 2013, p.1). The term 'welfare economics' was coined by Arthur Cecil Pigou in his publications *Wealth and Welfare (1912) and Economics of Welfare (1920)*, (Nath, 1973; Baujard, 2013; Caldari & Nishizawa, 2014; Forte, 2018). Modern welfare economics has, since, emerged through an evolution process of aggregating the different theories of different economists across different times, namely Pareto Optimality, Kaldor-Hicks Compensation Criterion, Social Welfare Function of Bergson and Samuelson, Scitovisky Criterion, and Amartya Sen's Theory of Welfare (Irshad, 2016, p. 2-3). However, Black and Siebrits (2019, p. 84), claim that when assessing the welfare effects of public policy, economists normally distinguish between two criteria: Pareto Optimality and Bergson criterion.

The Pareto Optimality criterion, named after Vilfredo Pareto, is a state of economic affairs where no one can be made better off without simultaneously making at least one other person worse off (Nas, 1996, p.11). This means that under the Pareto criteria, then, a policy-induced change is justified only if it improves the wellbeing of at least one person without harming any other (Black & Siebrits, 2019, p. 84). Additionally, according to Akter (2016) and, Black and Jansen (2019), this ideal and allocative efficiency requires the simultaneous concurrence of the following three conditions: Pareto optimality in consumption[1];

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1 Pareto optimality in consumption occurs when the marginal rates of substitution in consumption are identical for all consumers and no consumer can be made better off without making others worse off (Akter 2016, p. 31; Black & Jansen, 2019, p. 22).

Pareto optimality in production[2]; and simultaneous equilibrium for consumers and producers[3].

On the other hand, the Bergson criterion was first introduced by Abram Bergson in his article *A Reformulation of Certain Aspects of Welfare Economics (1938)*, (Nath, 1973, p. 57). Bergson, followed by Paul Samuelson in 1947, developed the 'Social Welfare Function' theory for measuring welfare (Irshad, 2016; Igersheim, 2019). Black and Siebrits (2019, p. 88-89) state that the Bergson criterion is best explained by a social welfare function according to which a community's welfare is defined in terms of the utilities of all the individuals making up the community. This makes the Bergson criterion much broader than earlier welfare theories and allows for welfare improvement even if one or more individuals are harmed in the process (Black & Siebrits, 2019, p. 84). This means that a redistribution of income can be justified on welfare grounds even if it places one or more individuals in a worse position (Black & Siebrits, 2019, p. 84).

The principles of welfare economics, thus, form the basis for research into how government interventions improve social welfare (Akter, 2016, p.43). Essentially, welfare economics creates the basis upon which stakeholders can judge the achievements of policymakers in allocating resources (Akter, 2016, p. 1). As such, research questions into the (possible) effects of various policies on the welfare of a society are either about the future impact (*ex ante*), e.g. if this economic policy will increase social welfare or about the past impact (*ex post*), e.g. if that economic policy increased social welfare (Nath, 1973, p. 57).

Empirical methods and techniques such as cost-benefit analysis (CBA), cost-effectiveness analysis (CEA), multi-criteria decision analysis (MCDA), and general equilibrium approaches aid in assessing the economic or overall societal effects of project or policy interventions (Robinson, 1993; Mullins et al., 2014).

3. MATERIALS AND METHODS

Cost-benefit Analysis: Given that the NYDA grant funding is financed from public funds, the primary hypothesis of this study was tested using the CBA methods as a means of evaluating the merits of the program. The CBA was

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2 Pareto optimality in production occurs when the marginal rate of transformation in production is identical for all products and it is impossible to increase the production of any good without reducing the production of other goods, (Akter, 2016, p. 31; Black & Jansen, 2019, p. 23).

3 Simultaneous equilibrium for consumers and producers occurs when the marginal rates of substitution in consumption are equal to the marginal rates of transformation in production, such as when production processes must match consumer wants, (Akter, 2016, p. 31; Black & Jansen, 2019, pp. 25-26).

used to quantify the net benefits of NYDA grant funding in the Eastern Cape by comparing the benefits thereof with the corresponding costs. The annual NYDA grant funding disbursed (i.e., costs) and the recipients' annual business turnover (i.e., benefits) were deemed applicable for the purposes of conducting the CBA. The following methodological steps were followed when conducting CBA.

The first step in the CBA was to identify and assign monetary values to the costs and benefits. The related costs were identified as the actual grant amounts disbursed through NYDA in the Eastern Cape. These costs were sourced and provided by the finance department of the NYDA from audited financial statements only for the period 2016-2019. In order to identify the benefits, the surveyed respondents were asked to indicate their businesses' annual turnovers over the period under review.[4] The associated benefits were then calculated from one year after the receipt of the participants' respective NYDA grant funding.

The second step was to discount the costs and benefits in order to evaluate them in a time dimension (i.e., base year/date). In line with suggestions by Mullins et al. (2014, p.69), 8% was selected as the discount rate in this study's CBA. The discounting formulas for each factor are presented below:

$$PVC = \sum \frac{C_t}{(1+r)^t} \qquad (1)$$

Where:

  $PVC = present\ value\ costs,$
  $C_t = costs,$
  $r = discount\ rate,\ and$
  $t = period.$

$$PVB = \sum \frac{B_t}{(1+r)^t} \qquad (2)$$

Where:

  $PVB = present\ value\ benefits,$
  $B_t = benefits,$
  $r = discount\ rate,\ and$
  $t = period.$

4 Considerations for establishing impact of the NYDA business support services were made using a 3-point Likert-type scale (1= no impact, 2 = minor impact, 3= major impact). The mean scores associated with the impact of NYDA grant funding were biased towards a score of 3 (i.e., major impact).

In the assessment criteria step of the CBA, the Net Present Value and Benefit-Cost Ratio were used as decision-making criteria.[5] The formulas are as follows:

$$NVP = \sum \frac{B_t - C_t}{(1+r)^t} \tag{3}$$

Where:

NPV = present value benefits,
B_t *= benefits,*
C_t *= costs,*
r = discount rate, and
t = period.

$$BCR = \frac{\sum \dfrac{B_t}{(1+r)^t}}{\sum \dfrac{C_t}{(1+r)^t}} \tag{4}$$

where:

BCR = benefit-cost ratio,
B_t *= benefits,*
C_t *= costs,*
r = discount rate, and
t = period.

The last step in the CBA was to determine how a change in any one or more of the variables would affect the value of the NPV and BCR, respectively. To that end, two percentage points are added and subtracted to the aforementioned 8% discount rate in order to calculate the upper and lower bound estimates.

Regression Analysis: The study also determined the significance of other factors (i.e., gender, education and growth rates) in influencing the business performance of the NYDA grant recipients. The secondary hypotheses were tested by using a least absolute deviation (LAD) regression analysis in cross-sectional data relating to respondents' annual turnover over the period 2014-2019. LAD is suggested as an alternative method to the ordinary least squares (OLS) approach to estimating regression coefficients, as it is insensitive to outliers and, therefore, tends to be more robust (Dodge, 1997; Giloni, Simonoff & Sengupta, 2006; Yong, 2014).

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5 A decision rule or criterion for the acceptance of a project is that the NPV must be greater than zero (i.e., positive); the BCR must be more than one ('1'), (Mullins et al., 2014, p. 42).

The secondary hypotheses are expressed in the following equation:

$$\pi_t = \beta_0 + \beta_1\phi_i + \beta_2\ddot{E}_i + \beta_3\Omega_i + e_i$$

Where:

π = *average annual turnovers (2014-2019),*
β_0 = *intercept term,*
ϕ = *gender (dummy variable: 1 if male; 0 if female),*
$\ddot{E}$ = *education (dummy variable: 1 if post school; 0 otherwise),*
Ω = *average Eastern Cape GDP growth rates per industry (2014-2019),*
e = *error term,*
i = i^{th} *observation, and*
t = *period.*

A priori expected signs of the coefficients β_1; β_2; β_3 were as follows:

Gender (ϕ): a positive coefficient was expected in that businesses owned by males accrue higher turnovers than their female counterparts.

Education ($\ddot{E}$): a positive coefficient was expected in that post-school education leads to improved turnovers.

Industry GDP Growth Rate (Ω): a positive coefficient was expected in that the growth rates of the provincial economy have a positive impact on turnover.

In order to test that the parameters were not statistically significant, a two-tailed t-test was performed.

Data Collection: In order to achieve Denzin's (1978) triangulation, the study employed multiple data collection methods, including using a questionnaire, focus group and secondary data. First, the NYDA was approached for a list of the NYDA grant funding recipients in the Eastern Cape province of South Africa over the period 2013-2018, and a list of approximately 681 beneficiaries was provided. A scientifically sound sample size was derived by use of a Raosoft calculator at a 5% margin of error, which was calculated to be 246 respondents. The study primarily adapted probability sampling, as well as snowballing techniques - where it was difficult to locate the study population. Ultimately, the total number of respondents who took part in this study amounted to 253. The questionnaire was used to collect data on the demographics of the NYDA grant funding beneficiaries, business characteristics, their subjective perceptions on the impact of the NYDA support interventions, as well as their business challenges. In order to test the internal consistency and, thereby, the reliability of the research instrument used, the Cronbach's alpha coefficient was calculated using IBM SPSS Statistics 27.0.1.0. The results obtained showed high reliability

at 0.829. To gather more detailed opinions and knowledge about the research topic a focus group session was held with selected participants based on their willingness to share information beyond the scope of the questionnaire during the face-to-face survey phase of the research. The participants are based in various locations within the Eastern Cape Province and were all business owners operating different types of businesses in different sectors. Lastly, secondary data used in the regression analysis (i.e., the GDP growth rates of the industry sectors in the Eastern Cape for the years 2014-2019) was sourced from Statistics South Africa website.

4. RESULTS

Table 1. Results of Cost-Benefit Analysis at 8% discount rate (2016-2019)

Years	Discount Factor	Total Costs	Present Value Costs	Total Benefits	Present Value Benefits
0	1	4 015 718.4	4 015 718.4	0	0
1	0.925925926	6 044 791.29	5 597 028.972	12 692 480.50	11 752 296.76
2	0.85733882	10 307 681.67	8 837 175.643	31 534 948.50	27 036 135.55
3	0.793832241	4 264 841.08	3 385 568.352	50 414 912.50	40 020 982.97
		R24 633 032.44	**R21 835 491.37**	**R94 642 341.50**	**R78 809 415.28**

Source: Authors' calculation

First, the results presented in Table 1 indicate that when total costs are subtracted from the total benefits, the grant funding offered by the NYDA over the period 2016-2019 led to a social welfare gain of R70 009 309.06. From the presented results, the NPV results were greater than zero (i.e., NPV>0). The results also indicate that the BCR was more than one (BCR>1).

Table 2. Results of Cost-Benefit Analysis at 6% discount rate (2016 - 2019)

Years	Discount Factor	Total Costs	Present Value Costs	Total Benefits	Present Value Benefits
0	1	4 015 718.40	4 015 718.40	0	0
1	0.943396226	6 044 791.29	5 702 633.29	12 692 480.50	11 974 038.21
2	0.88999644	10 307 681.67	9 173 799.99	31 534 948.50	28 065 991.90
3	0.839619283	4 264 841.08	3 580 842.81	50 414 912.50	42 329 332.69
		R24 633 032.44	**R22 472 994.49**	**R94 642 341.50**	**R82 369 362.80**

Source: Authors' calculation

Based on these calculations presented in Table 2, the NPV results were found to be greater than zero (i.e., NPV>0). The BCR results were also found to be more than one (BCR>1).

Table 3. Results of Cost-Benefit Analysis at 10% discount rate (2016-2019)

Years	Discount Factor	Total Costs	Present Value Costs	Total Benefits	Present Value Benefits
0	1	4 015 718.40	4 015 718.40	0	0
1	0.909090909	6 044 791.29	5 495 264.81	12 692 480.50	11 538 618.64
2	0.826446281	10 307 681.67	8 518 745.18	31 534 948.50	26 061 940.91
3	0.751314801	4 264 841.08	3 204 238.23	50 414 912.50	37 877 469.95
		R24 633 032.44	**R21 233 966.62**	**R94 642 341.50**	**R75 478 029.49**

Source: Authors' calculation

From the presented calculations in Table 3, the NPV results were greater than zero (i.e., NPV>0). The BCR results were similarly found to be more than one (BCR>1).

**Table 4.** Results of Least Absolute Deviation Regression Analysis

Variable	Coefficient	Std. Error	t-ratio	p-value	Significance
Constant	3.89638	0.119073	32.72	<0.0001	***
Gender	0.398662	0.135689	2.938	0.0036	***
Education	0.645200	0.127056	5.078	<0.0001	***
Industry GDP growth rates	0.102445	0.0596059	1.719	0.0869	*

Source: Authors' calculation

* significant at the 10 percent level
** significant at the 5 percent level
*** significant at the 1 percent level
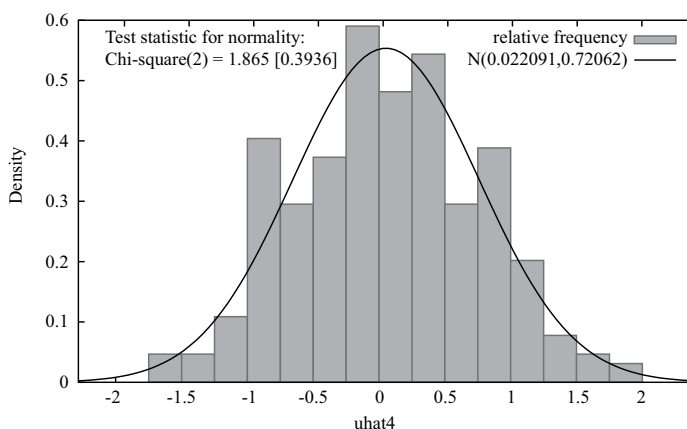
Figure 1. Normality of residual

Source: Authors' calculation

http://www.ae.ef.unibl.org/

The regression results presented in Table 4 indicate that gender, education, and industry GDP growth rates are all significantly related to the performance of the respondents' annual business turnovers. The test for normality presented in Figure 1 further confirmed that the variables are independent of each other (i.e., are not associated).

5. DISCUSSIONS OF THE RESULTS

The CBA revealed that the estimated benefits exceed the estimated costs (i.e. NPV is positive), given the applied discount rates (8%, 6% and 10%). The CBA findings further imply that the public expenditure for Eastern Cape youth businesses through the NYDA grant funding was economically viable during the period under review (i.e., BCR more than one). Since the CBA was conducted *ex post*, this makes the research findings useful for learning about the actual rather than a projected value of the program.

The CBA findings were supported by the focus group discussion. In general, the focus group participants indicated that the NYDA's grant funding was beneficial, as it helped the participants to: kick-start their businesses, obtain assets that are still in their possession and regularly used in their business operations, have a professional businesses appearance and ultimately secure business opportunities. It was also noted from participants that without the NYDA grant funding their businesses' performance would have been poor as it would have taken longer for their businesses to establish and grow. The participants further stated that they gained value from the NYDA's grant funding as it came with other non-financial business support services, including pre and post-care from NDYA staff. At the same time, the focus group participants suggested improvements in the areas of access to finance for businesses in the growth or expansion stage, application turnaround times, access to markets, links to the entrepreneurship ecosystem, lowering administrative burden, mentorship, monitoring and evaluation and organizational culture.

The LAD regression results further showed that the annual turnovers of the participating youth businesses were impacted by factors such as gender, education, and industry GDP growth rates. These findings revealed that business turnovers of the NYDA grant funding recipients are biased towards male-owned businesses, as well as business owners with post-school qualifications. Also, the economic performance of the Eastern Cape industry sectors had an impact on the success of the participants' business turnovers.

6. CONCLUSIONS AND RECOMMENDATIONS

The study concludes that NYDA grant funding in the Eastern Cape generally yields positive social returns in the form of relative increases in recipients' business turnover, and thus contributed to increased welfare in the province. However, the recipients' gender, education and industry GDP growth rates also had a significant impact on the business annual turnover. Notwithstanding the presented conclusions, in order to optimize the economic benefits of the public spending through the grant funding program, it is recommended that NYDA implements the following:

– Increase the grant funding budget significantly to make the program permanently sustainable.
– Provide business support services to more female entrepreneurs, to grow the number of female-led youth-owned businesses.
– Develop a grant funding-linked service aimed specifically at providing disabled youth entrepreneurs with business support services.
– Promote entrepreneurship as a viable and even preferred career choice for youth – especially youth with a tertiary education, supported by entrepreneurship education that cuts across all education fields.
– Consider more rural youth entrepreneurs as possible grant funding recipients, to grow the number of rural youth-owned businesses.
– Provide more support in the sectors where young people appear to be struggling to establish their presence, i.e., agriculture, utilities, construction, and logistics to grow the number of youth businesses in these industries.
– Review the current grant funding exclusions in relation to extant businesses' annual turnover limits; as well as the methodology used to calculate grant amount ranges to be awarded to youth enterprises, particularly in respect to those businesses operating in the growth or expansion stage.
– Strengthen the training and re-training of young entrepreneurs in the areas of innovative marketing and sales pitching, as well as public procurement and tendering. This should be supported by NYDA prioritizing youth entrepreneurs as part of their own internal procurement processes including qualifying NYDA grant funding recipients.
– Digitize the grant funding application process and develop an online grant funding tracking system, where applicants can easily track the progress and status of their application without having to visit or call NYDA offices.
– Make use of online platforms as a means of ensuring easy access and wider reach of its existing Entrepreneurship Development Program.
– Review the current business mentorship programs in order to improve their effectiveness.

- Lobby private and public institutions to provide business infrastructure support for youth businesses, including business premise rental subsidies or discounted rates, mobile vans/containers, and/or designated market stalls.
- Make a case for the extension of Covid-19 relief support schemes for youth businesses for a minimum of 3 years.
- Review the present grant funding practices against international best practices, so as to improve the culture of its organization in serving youth businesses.

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Conflict of Interests

The authors declare there is no conflict of interest.

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ОПТИМИЗАЦИЈА ЕКОНОМСКИХ КОРИСТИ ЈАВНЕ ПОТРОШЊЕ ИЗ ГРАНТ ФИНАНСИРАЊА НАЦИОНАЛНЕ АГЕНЦИЈЕ ЗА РАЗВОЈ МЛАДИХ

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САЖЕТАК

Ова студија је испитала економске користи гранта Националне агенције за развој младих у Источном Кејпу, користећи анализу трошкова и користи и регресиону анализу најмањег апсолутног одступања на узорку од 253 испитаника. Студија је показала да јавна улагања у омладинско предузетништво кроз грантове Агенција доносе позитивне друштвене поврате. Студија је даље открила да развој омладинског предузетништва треба да превазиђе само финансирање грантова Агенције и да укључи повољне политике за престанак родних неравноправности, подстицајне образовне системе, као и обезбјеђивање различитости привредних сектора.

Кључне ријечи: *економија благостања, социјална заштита, економски утицај, анализа трошкова и користи, млади, предузетништво, финансирање грантова, Национална агенција за развој младих.*