

Youth Unemployment and Educational Attainment in South Africa: An Application of Bayesian Vector Autoregressive Model with the Minnesota Prior

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Abstract

Despite near-universal secondary school enrolment, South Africa faces a paradoxical challenge of high youth unemployment, with nearly two-thirds of young people affected. This study seeks to explore the relationship between youth unemployment and educational attainment, specifically focusing on secondary and tertiary education in South Africa. The study employs the Bayesian vector autoregressive model with the Minnesota prior and quarterly frequency data from 2008 to 2022. In line with the human capital theory, which hypothesizes that labour force employability is a function of educational attainment, we find that tertiary education attainment reduces youth unemployment, with a significant impact on the upper youth labour force, whereas secondary education attainment exacerbates youth unemployment, with a severe impact on the lower youth labour force. The study also finds that persistent youth unemployment discourages young South Africans from pursuing both secondary and tertiary education. As a result, youth unemployment in South Africa is predominantly composed of youthful school leavers. The study findings suggest that South African youths can hedge against unemployment risk through tertiary education attainment, with highly educated graduates having the best labour market prospects.

Keywords: *Bayesian VAR Model with Minnesota Prior, Education Attainment, Youth Unemployment, South Africa.*

Introduction

South Africa's education system is categorized into two strata: basic education and higher or tertiary education. The basic education system has two levels: General Education and Training (GET) and Further Education Training (FET). GET (grade 0 to 9) includes compulsory education for ages (7 to 15 years) as specified in the South African School Act 84 of 1996. Grade 8 to 9 is commonly referred to as lower secondary education. FET, commonly referred to as upper secondary or post-secondary non-tertiary education, is offered from grades 10 to 12, which corresponds to levels 2 to 4 of the National Qualifications Framework (NQF). Alternatively, in Technical and Vocational Education and Training (TVET) colleges, FET is offered at levels 1 to 3 of the National Certificate, providing students with practical skills and qualifications. This level of education emphasizes career-oriented education and training. Tertiary education includes undergraduate to doctoral qualifications, as well as other higher education qualifications that are classified above NQF level 4. The Bill of Rights of the Republic of South Africa's Constitution, Act 108 of 1996, holds the government accountable for providing basic education to all South Africans. Perhaps this is one of the reasons why the government prioritizes basic education over tertiary education in terms of funding. In the 2019/2020 budget, for instance, only 1.1% (Trading Economics, 2022) of the total (6.2%) (Trading Economics 2022a) government funding as a share of Gross Domestic Product (GDP) on education was allocated to tertiary education, and the rest was allocated to basic education.

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While tertiary education is not compulsory and receives relatively less government funding compared to basic education, it remains a crucial source of skilled and qualified young professionals entering the labour force. A review of OECD education statistics shows that South Africa's employment rate of tertiary education graduates aged 25 to 34 years (upper youths) was 85% in 2018 (OECD, 2019). Likewise, Figure 1 shows that the ratio of unemployed South Africans with tertiary education qualifications to the upper youth labour force has been less than 10% since 2008. Overall, Figure 1 indicates that youth employability in South Africa increases with educational attainment and age. Thus, minimizing unemployment risk through higher education attainment appears to be feasible in South Africa, and the payoff tends to be higher among upper youths.

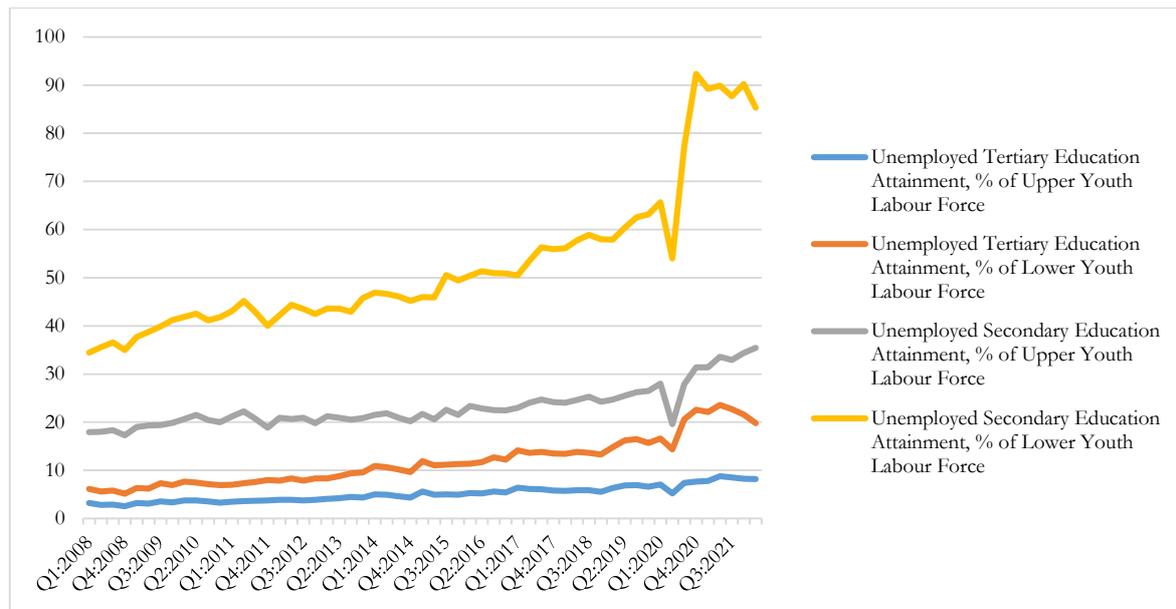


Figure 1: South Africa's unemployed population with Secondary and Tertiary Education qualifications, as a ratio of youth group labour force for the period (Q1:2008-Q1:2022).

Source: Authors' estimations using QLFS data (QUANTEC, 2022).

With the increase in educational attainment since the implementation of the South African School Act in 1996 (OECD 2019a), one would expect youth unemployment to be low in South Africa. However, youth unemployment has been persistently high, with lower youths (15 to 24 years) being the most vulnerable in the labour market (Stats SA 2021). South Africa's Quarterly Labour Force Survey (QLFS) statistics show that upper and lower youth unemployment rates were 52.8% and 75.1% in the first quarter of 2022 (Q1: 2022), respectively, 19.2% and 18.7% higher than in Q1: 2008. Overall, the unemployment rate of South Africa's working age (15 to 64 years) population increased from 30.9% in Q1: 2008 to 45.5% in Q1: 2022. This is a perplexing scenario, a natural issue to peruse is whether the supply of youths with tertiary education qualifications in the labour market is increasing faster than demand, or whether youths are reluctant to pursue tertiary education, resulting in an accumulation of youths without higher education qualifications in the labour market.

A look at OECD education statistics shows that South Africa's educational attainment is skewed towards upper secondary education. In 2018, more than half (59%) of South Africa's working-age population had upper secondary qualifications as their highest educational attainment, relative to 7% with tertiary education qualifications. Upper youths with upper secondary education made up 77% of the working-age population, while tertiary education graduates made up only 6%. Despite efforts to reduce the proportion of upper youths without an upper secondary education from 27% in 2008 to 18% in 2018, tertiary education is less prevalent in South Africa, which is cause for concern. As noted in OECD's 2019 education report for South Africa, "young South Africans with upper secondary education are over twice as likely to be neither in

employment nor in education or training (NEET) than those with a tertiary education.” (OECD 2019a: 2). Based on this narrative, it is reasonable to suggest hypothetically that youth unemployment is prevalent among youth population with at most secondary education as their highest qualification. Thus, the purpose of this study is to investigate how youth unemployment responds to secondary and tertiary education attainment shocks over time. The study also aims to forecast youth unemployment in South Africa to inform progress of the National Development Plan (NDP)’s goal of reducing unemployment to less than 6% by 2030. In South Africa, the youth age group ranges from 15 to 34 years, with lower youth (15 to 24 years) and upper youth (25 to 34 years) (Stats SA 2021). The study focuses on the lower and upper unemployed youth populations separately for policy insights. The study would have been more informative if the analysis had been conducted separately for each secondary and tertiary education attainment stratum, but disaggregated data is scarce. To the best of our knowledge, this is the first study to analyse how youth unemployment responds to secondary and tertiary education attainment shocks over time; thereby contributing to literature on youth unemployment.

The study is divided into five sections. Following this introductory section, literature on the relationship between youth unemployment and educational attainment in South Africa is reviewed. The empirical strategy is described in Section three. Section four presents and discusses the findings. Section five concludes the study.

Youth unemployment and Educational Attainment Nexus in South Africa

As with previous empirical studies (Dias & Posel 2007; Mpendulo & Mang’unyi 2018; van Broekhuizen 2016), the relationship between youth unemployment and educational attainment in this study is theoretically centred on the human capital theory. According to the human capital theory, formal education is a vital factor in labour’s marginal productivity and earnings. Productivity expected from the labour force is often linked to educational attainment; the higher the level of educational attainment, the more productive an individual is perceived to be. This follows that highly educated individuals are more competitive in the labour market and, as a result, more employable due to their perceived productivity.

Despite the country's persistent increase in youth unemployment, empirical evidence linking youth unemployment and educational attainment remains scarce in South Africa. Using the probit regression model, Dias and Posel (2007) found that tertiary education hedged against unemployment risk in South Africa from 1995 to 2003, and the payoff benefits increased over time. Similarly, van Broekhuizen (2016) separated graduates (degree holders or NQF level 7 and above) from other tertiary education qualifications to analyze graduate unemployment in South Africa using the probit model for the period (2000-2013) and found that graduates are the only group with the best labour market prospects relative to other education cohorts. The study emphasized the importance of tertiary education quality and level in the unemployment-tertiary education attainment nexus. In contrast to Dias and Posel (2007), van Broekhuizen (2016) and QLFS statistics (Figure 1), Mpendulo and Mang’unyi (2018) found a significant positive relationship between education level and youth unemployment in selected rural district municipalities in the Eastern Cape province of South Africa. However, Mpendulo and Mang’unyi’s findings can hardly be generalized due to sampling bias.

With this evidence, it is meaningful to associate South Africa’s youth unemployment with a lack of tertiary education attainment among the youth labour force. As asserted by OECD (2019a), tertiary education is not widespread in South Africa, with the majority of the population having at most secondary education as their highest qualification. Furthermore, Trading Economics statistics show that tertiary education in South Africa receives less government funding than basic education (Trading Economics 2022; 2022a). According to Horner, Zhang, and Furlong (2018), adequate government funding for tertiary education can significantly reduce unemployment. Building on the contributions of previous empirical studies, this study explores the response of youth unemployment in South Africa to secondary and tertiary education attainment shocks using a Bayesian VAR approach from Q1: 2008 to Q1: 2022.

Methodology

Data and Empirical Strategy

Data on educational attainment in South Africa is scarce, with only data for secondary and tertiary education, among other educational qualifications, available from Q1: 2008 to Q1: 2022. To account for this short time dimension, the study uses a Bayesian Vector Autoregressive (VAR) model with a Minnesota prior to simulate youth unemployment as a function of secondary and tertiary education attainment (% of the labour force for a specific youth age group), while controlling for inflation. The Bayesian VAR model with the Minnesota prior is effective for modelling and forecasting long-run relationships among short non-stationary macroeconomic time series (see, for example, Lopreite & Zhu 2020; Ma, Shang & Zhang 2021). Data for this study is obtained from QUANTEC. QUANTEC provides data on educational attainment in totals of the employed, unemployed, and economically inactive population. To meet the study's objective, we converted total secondary and tertiary education attainment for the economically active population to percentages of the labour force for each youth age group. Inflation is measured as the consumer price index (CPI) of all items.

Bayesian VAR model with Minnesota Prior

Bayesian VAR model was proposed primarily to counteract the curse of dimensionality associated with an unrestricted frequentist or classical VAR when data is inadequate in multi-series (see, for example, Crump, Eusepi, Giannone, Qian & Sbordone 2021; Kotzé 2013; Kuschnig & Vashold 2021; Lopreite & Zhu 2020; Ma *et al.* 2021). The resulting structural inferences and forecasts tend to be spurious due to overfitting. Thus, the mathematical form of the Bayesian VAR model is derived based on unrestricted frequentist VAR(p) as shown in Equation (1) below.

$$y_t = \alpha + \sum_{i=1}^p \Phi_i y_{t-i} + \varepsilon_t, \text{ with } \varepsilon_t = N \sim (0, \Sigma) \quad (1)$$

where y_t is the $K \times 1$ vector of endogenous variables in time t , p is the maximum lag order, α represents a $K \times 1$ intercept vector or constant variable, Φ_1, \dots, Φ_p are $K \times K$ matrices of VAR(p) coefficients, and ε_t is the white noise error term or $K \times 1$ exogenous Gaussian shocks, with mean 0 and $K \times K$ variance-covariance Σ .

Traditionally, the curse of dimensionality is addressed by imposing certain restrictions in Equation (1), such as removing some series and decreasing the lag order. However, the Bayesian approach “addresses the curse of dimensionality by automatically selecting the degree of shrinkage, using tighter priors when the number of unknown coefficients relative to available data is high, and looser priors otherwise.” (Crump *et al.* 2021: 9). Ma *et al.* (2021: 4) also note that Bayesian VAR “creatively combines the predictor’s prior information on the island” with Equation (1). According to Lopreite & Zhu (2020: 3), Bayesian VAR utilises priors as key factors that “makes additional knowledge available during the estimation and hence achieves better results without the need of requiring restricted models.” In a nutshell, the Bayesian approach allows researchers to combine sample data with prior knowledge of VAR coefficients (priors) to estimate the posterior distribution using the maximum likelihood function.

There are several priors, but the Minnesota prior of Litternam (1986) is considered to be effective in modelling and forecasting short macroeconomic persistent time series and is used as a baseline to evaluate accuracy. Minnesota prior imposes the hypothesis that individual series in Equation (1) follow “independent random walk processes potentially with drift, a parsimonious yet reasonable approximation for the behaviour of economic variables.” (Crump *et al.* 2021: 10). Therefore, the Minnesota prior shrinks the estimates of Equation (1) towards a multivariate random walk model using the mean and covariance matrix moments outlined below (Kotzé 2013):

$$\Phi_{ij,p} \begin{cases} \lambda/p^2 & \text{if } i = j, \\ (\lambda \theta \delta_i / p \delta_j)^2 & \text{if } i \neq j. \end{cases} \quad (2)$$

The prior shrinkage parameter (λ) controls the overall prior variance of all coefficients in Equation (1), whereas θ controls the tightness of the variances of the coefficients of lagged variables other than the dependent variable in each specification (Kotzé 2013). As $\lambda \rightarrow 0$ the posterior distribution shrinks towards the prior mean, implying that the prior information dominates the sample information. If on the other hand, $\lambda \rightarrow \infty$ the posterior distribution shrinks towards the sample information and the posterior estimates converge to the coefficients of Equation (1), implying that the prior becomes non-informative. Following Kotzé (2013) we set our prior with $\lambda = 0.2$ and $\theta = 0.5$. Because more recent lags are assumed to be more likely to have nonzero values, the shrinkage parameter decreases as lag length (p) increases. To account for ignorance about the actual values of the parameters, the standard deviations for the intercept terms are set to infinity. Furthermore, the prior distribution imposes parameter independence.

This study aims to explore the response of upper (*UYU*) and lower (*LYU*) youth unemployment to secondary and tertiary education attainment shocks while controlling for inflation (*Infl*) for 57 periods (Q1: 2008–Q1: 2022). The study period observed an increase in educational attainment in South Africa, which is attributed to post-independence educational reforms (van Broekhuizen, 2016). During this period, the country also experienced persistently high youth unemployment and inflation. The structural responses are obtained by imposing a recursive structure on the impact multiplier matrix, with the models specified and variables ordered as follows:

$$y_t = (UYU_t, Sec_UY_t, Infl_t)' \quad (3)$$

$$y_t = (LYU_t, Sec_LY_t, Infl_t)' \quad (4)$$

$$y_t = (UYU_t, Ter_UY_t, Infl_t)' \quad (5)$$

$$y_t = (LYU_t, Ter_LY_t, Infl_t)' \quad (6)$$

The subscripts *Sec_UY* and *Sec_LY* represent secondary education attainment as a percentage of the upper and lower youth labour force, respectively. Likewise, *Ter_UY* and *Ter_LY*, proxy tertiary education attainment as a percentage of the upper and lower youth labour force, respectively. Inflation is ordered last in all specifications, so the shock to the inflation equation can be interpreted as a monetary policy shock without a contemporaneous effect on youth unemployment and educational attainment.

Results and Discussion

The analysis is conducted for 57 periods from Q1: 2008 to Q1: 2022 due to data availability. The main findings of the study following Equations (3) to (6) in their order are presented and discussed after the descriptive statistics.

Descriptive Statistics

Figure 2 exhibits the descriptive statistics for each series used in this study. Upper (UYU) and lower youth unemployment (LYU) rates increased from 33.6% and 56.4% in Q1: 2008 to 52.8% and 75.1% in Q1: 2022, respectively. Secondary education attainment as a percentage of the upper youth labour force (*Sec.Edu_UY*) increased by 22.5% from 74.6% to 97.1% during the same period, while tertiary education as a percentage of the same age group (*Ter.Edu_UY*) increased by 8.4% (from 37.1% to 45.5%). Secondary education attainment as a percentage of the lower youth labour force (*Sec.Edu_LY*) almost doubled from 143.43% in Q1: 2008 to 233.9% in Q1: 2022, while tertiary education attainment as a percentage of the same age group (*Ter.Edu_LY*) increased by 38.3% (from 71.3% to 109.6%). These statistics indicate that secondary education attainment has been higher than tertiary education attainment across all youth age groups. Furthermore, comparing the two age groups in terms of unemployment and education attainment reveals that lower youths are more vulnerable in the labour market, despite having relatively high education attainment (both secondary and tertiary). If the employability of South African youths is subject to education level and age as indicated by OECD (2019a) and Figure 1, we expect secondary educational attainment shock to increase youth unemployment, with a severe impact among lower youths. In contrast, we expect youth unemployment to decline as a result of tertiary education attainment shock, particularly among upper youths. Inflation constantly increased from 49% in Q1: 2008 to 101% in Q1: 2022. All three series demonstrate considerable persistence, so applying the Minnesota prior with shrinkage to a random walk appears to be reasonable.

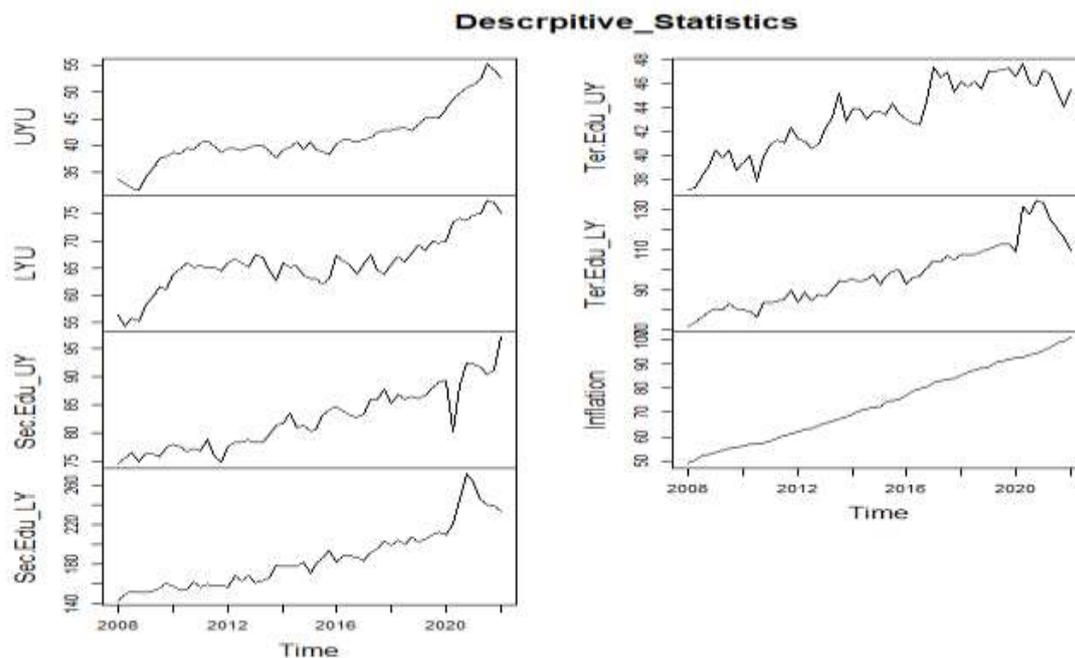


Figure 2: Descriptive statistics

Source: Authors' computation using *gtsplot* in *BRM* package, RStudio.

Main Findings

Estimates for each youth age group and level of educational attainment were conducted separately, as shown in Equations (3) to (6). All specifications were estimated using the *BRM* package for Bayesian VAR with the Minnesota prior in RStudio. We applied the Minnesota prior in a VAR(2) model with intercept. As noted in Kotzé (2013), the unknown error variances are replaced by estimates obtained from fitting univariate autoregressive(AR(2)) models to the individual model variables. Moreover, estimates of the error

covariances are not required for prior specification. The error covariance matrix is treated as known when constructing the posterior distribution and is replaced by its least square estimate.

As a pre-estimation check, we estimated posterior distribution density functions for all parameters in each specification and found that they are normally distributed. Figures 3–6 exhibit the results side by side, with IRFs on the left and Forecasts on the right. The IRFs demonstrate how various shocks affect the posterior density of structural impulse responses. This study is mainly interested in the response of youth unemployment to education attainment shock (second row, first column of each IRF graph). Figures 3 and 4 illustrate the response of upper youth unemployment to secondary and tertiary education attainment shocks. Figures 5 and 6 exhibit the shocks from secondary and tertiary education to lower youth unemployment. The shaded areas represent the posterior coverage intervals for 95% of the Bayesian credible sets obtained through Gibbs sampling with 10000 iterations. For each specification, the IRFs are presented for up to 40 periods (10 years). The forecasts range from Q1: 2022 to Q4: 2025.

Response of upper-age youth unemployment to secondary education attainment

Figure 3 shows that a shock from secondary education attainment among the upper youth labour force increases the upper youth unemployment by approximately 0.4% for the first two periods (half a year), with a post-shock peak in period 2 (second row, first column). The impact gradually converges asymptotically towards 0 and becomes less effective after period 20 (5 years). These results indicate that a one-time shock from secondary education attainment among the upper youth labour force can significantly increase upper youth unemployment in the short and long run, albeit the impact is less severe in the long run. On the other hand, an upper youth unemployment shock raises secondary education attainment among the upper youth labour force by approximately 0.2% over the first 3 periods, then declines towards 0 and becomes less significant after 5 years (first row, second column).

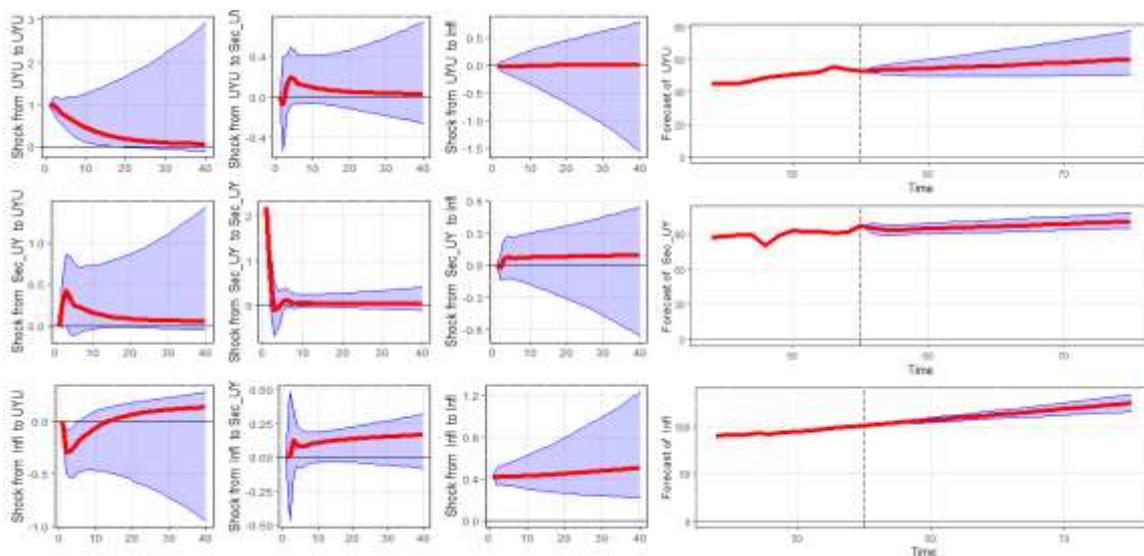


Figure 3: Bayesian VAR IRFs and Forecasts

NOTE: Upper youth unemployment (UYU), secondary education attainment as a percentage of the upper youth labour force (Sec_UY), and inflation (infl)

Source: Authors' computation using RStudio

Despite the evident reverse causality, the former shock is twice as severe as the latter, implying that upper youth unemployment as a function of secondary education attainment must be addressed. However, we do not presume that the positive impact of unemployment on secondary education attainment among upper

youths should be overlooked; rather, the labour market benefits of education are realized at the tertiary education level (see, second row, first column, Figure 5; Figure 1; OECD 2019a).

Response of Lower-Age Youth Unemployment to Secondary Education Attainment

Figure 4 shows that a shock from secondary education attainment among the lower youth labour force increases lower youth unemployment by approximately 0.6% in the first 2 periods, with the post-shock peak in period 2 (second row, first column). The impact gradually declines asymptotically towards 0 and becomes less effective after period 20 (5 years). Thus, a one-time shock from secondary education attainment among the lower youths can significantly increase lower youth unemployment in both the short and long run, albeit the impact is less effective in the long run. On the other hand, the unemployment shock among lower youths raises their secondary education attainment to a peak of 1.5% in the first period (first row, second column). The impact declines to 0 in period 9 and becomes negative after period 10 (2.5 years). This implies that the positive impact of unemployment among lower youths on their secondary education attainment is transitory.

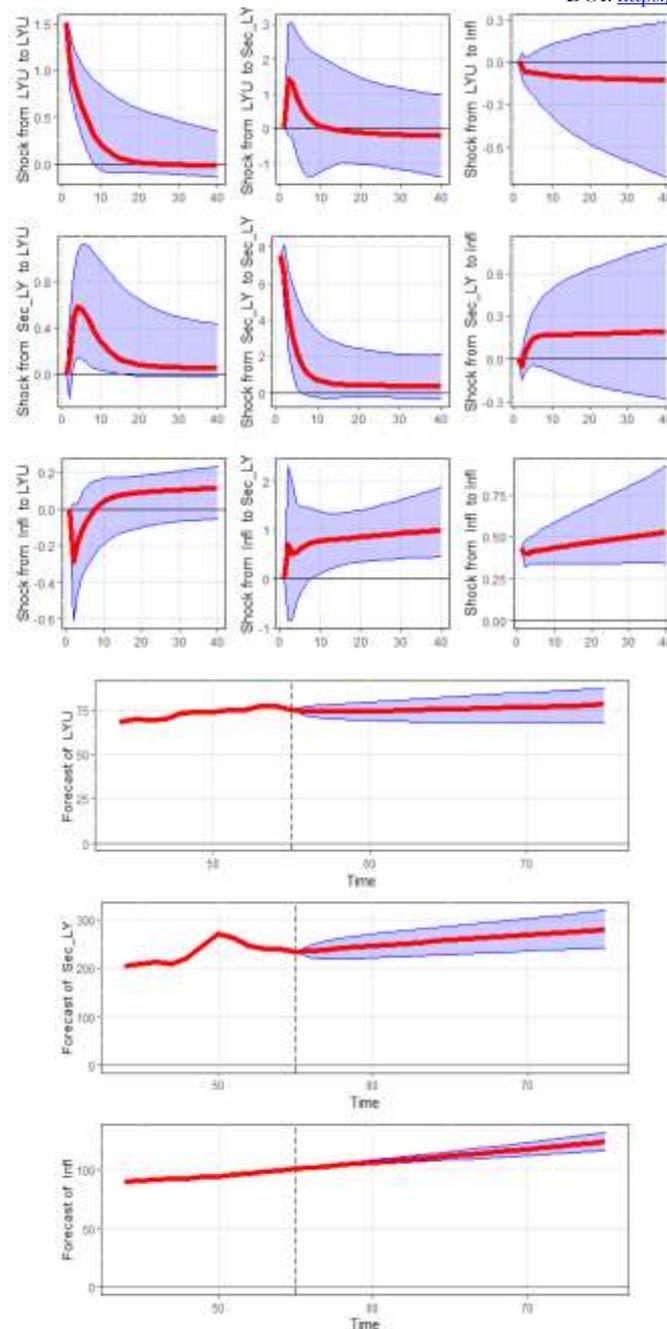


Figure 4: Bayesian VAR IRFs and Forecasts

NOTE: *Lower youth unemployment (LYU), secondary education attainment as a percentage of the lower youth labour force (Sec_LY), and inflation (infl).*

Source: Authors' computation using RStudio

After 2.5 years unemployment among lower youths reduces their secondary education attainment. This finding suggests one of two possibilities: either the persistent increase in lower youth unemployment discourages young South Africans from pursuing secondary education qualifications, or they are advancing their qualifications beyond secondary education to enhance their employability. However, a look at Figure 6 (first row, second column) shows that unemployment among lower youths has a negative impact on their tertiary education attainment in both the short and long run, which basically means that persistent lower

youth unemployment discourages young South Africans from pursuing both secondary and tertiary education. This explains why the majority of South Africa's jobless are early school leavers (Dias & Posel 2007; van Broekhuizen 2016). Overall, comparing Figures 3 and 4, we find that secondary education shock is more severe among lower youths than among upper youths.

The Response of Upper-Age Youth Unemployment to Tertiary Education Attainment

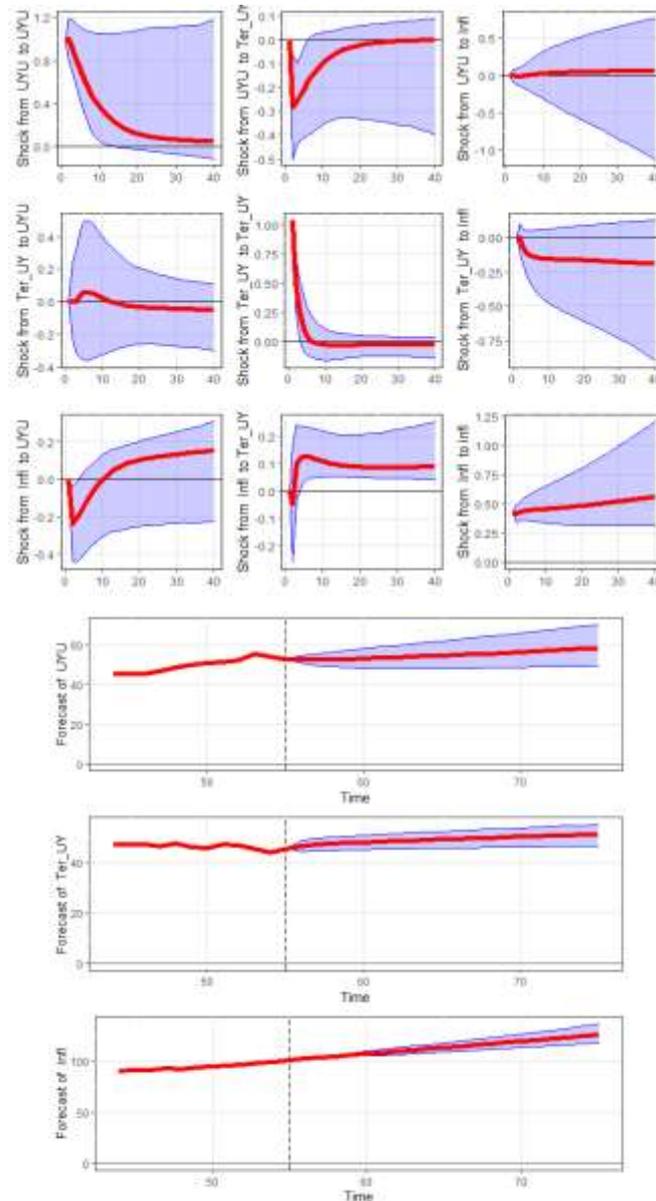


Figure 5: Bayesian VAR IRFs and Forecasts

NOTE: Upper youth unemployment (LYU), tertiary education attainment as a percentage of the lower youth labour force (Ter_UY), and inflation (infl).

Source: Authors' computation using RStudio

Figure 5 shows that a tertiary education spike among the upper youth labour force does not seem to cause a significant change in their unemployment rate in the first 2 periods (second row, first column). The impact increases upper youth unemployment by about 0.08% in periods 2-5, with a post-pick in period 5, then

gradually declines to 0 in period 10 (2.5 years) and turns negative thereafter. These findings indicate that the deleterious impact of tertiary education attainment on upper youth unemployment is short-lived. After 2.5 years, tertiary education attainment among upper youths significantly reduces upper youth unemployment. On the other hand, unemployment among upper youths discourages them from pursuing tertiary education only in the short run, with the shock dissipating after period 20 (5 years) (first row, second column). These findings confirm that the long-run negative relationship between these two variables runs from tertiary education to unemployment; thus, upper youths can hedge against unemployment by obtaining tertiary education qualifications, and the higher the better, as van Broekhuizen (2016) suggests.

The Response of Lower-Age Youth Unemployment to Tertiary Education Attainment

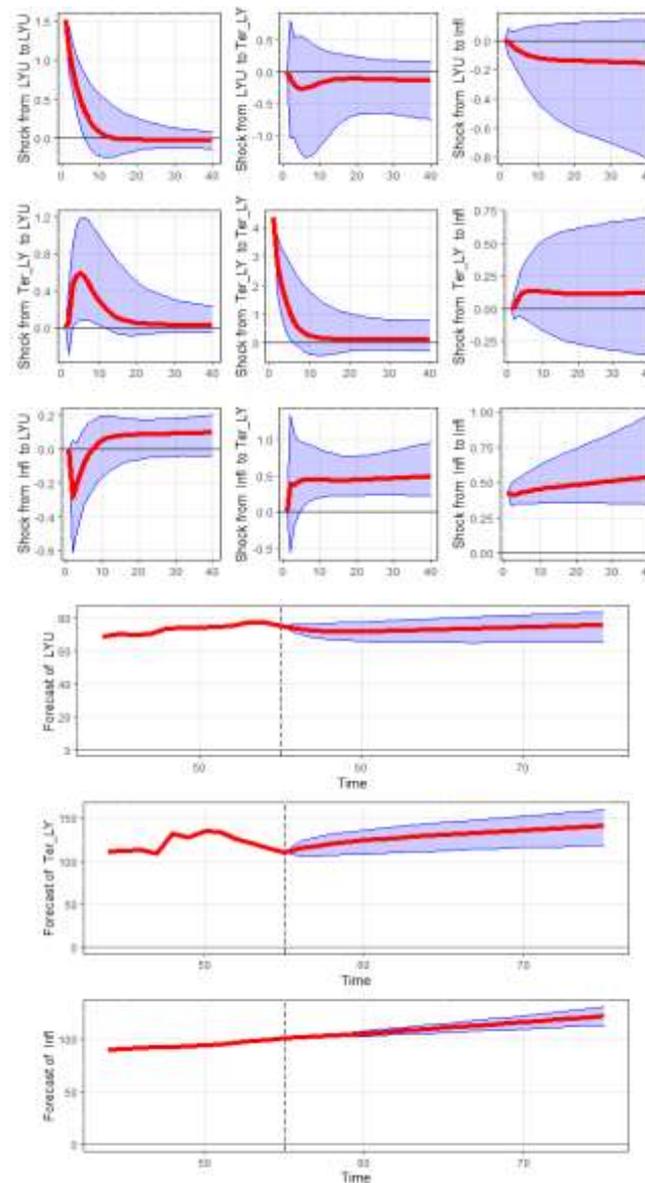


Figure 6: Bayesian VAR IRFs and Forecasts

NOTE: Lower youth unemployment (LYU), tertiary education attainment as a percentage of the lower youth labour force (Ter_LY), and inflation (infl).

Source: Authors' computation using RStudio

Figure 6 shows that a shock from tertiary education attainment among lower youth labour force increases lower youth unemployment by 0.6% for the first 5 periods, with a post-shock peak in period 5 (second row, first column). The impact gradually declines towards 0 and dissipates after period 20 (5 years). Thus, a significant increase in lower youth unemployment resulting from tertiary education attainment shock among lower youths is transient. This is not surprising given that lower youths as new graduates have a low level of experience, making them less competitive in the labour market. They are, however, gradually absorbed over time. Overall, the findings in Figures 3–6 are consistent with other empirical studies (Dias & Posel 2007; van Broekhuizen 2016), confirming that tertiary education attainment can significantly reduce youth unemployment, with the payoff benefits evident among upper youths (OECD, 2019a; Figure 1).

The Response of Youth Unemployment to Inflation Shock and Forecasts of All Series

Figures 3–6 show that the response of youth unemployment (both lower and upper) to an inflation shock is consistent across all specifications (third row, first column). An inflation shock sharply reduces youth unemployment by approximately 0.3% in the first period. After period 1, the unemployment rate gradually rises. However, the negative impact on youth unemployment is evident beyond the 12th period for upper youth unemployment (Figure 3) and the 7th period for lower youth unemployment (Figure 4) in the case of secondary education attainment, and the 10th (Figure 5) and the 8th (Figure 6) in tertiary education attainment, respectively. If these results are read along with the inflation series in Figure 2, we can derive that the decisive impact of inflation (expansionary monetary policy) on youth unemployment is transitory and subject to an inflation threshold rate of 54.4%, assuming no wage puzzle. Inflation above 54.4% can exacerbate youth unemployment, though long-term negative effects are observed above 80%. This is concerning because inflation forecasts across all specifications (see bottom Forecast graphs across all Figures 3–6) indicate that inflation will continue to rise from 101% in Q1: 2022 to around 150% in Q4: 2025. Similarly, upper and lower youth unemployment rates are expected to rise further, reaching 60% and slightly more than 75%, respectively, in Q4: 2025. (see, top Forecasts graphs across all Figures 3–6). Although secondary education attainment among upper youth is expected to fall slightly to around 95% in Q3: 2022, the trend shows that it will rise back to 97.1% in Q4: 2025 (see, middle Forecast graph of Figure 3). As a result, secondary educational attainment among upper youths is unlikely to change significantly until Q4: 2025, whereas tertiary education among the same age group is expected to rise to 50% (see, middle Forecast graph of Figure 5), 4.5% higher than in Q1: 2022. Secondary and tertiary education attainment among the lower youth labour force is expected to rise further, reaching 250% (see middle Forecast graph of Figure 4) and 125% (see middle Forecast graph of Figure 6) in Q1: 2025, respectively.

Conclusion

The question of whether increased educational attainment is exacerbating youth unemployment in South Africa has recently piqued the attention of researchers, policymakers, and the media. Some argue that youths in South Africa can hedge against unemployment risk through tertiary education attainment, but tertiary education attainment is not prevalent in the country, while others argue that there is an excess supply of tertiary education qualifications in the labour market. Thus, in this paper, we examine the response of youth unemployment to secondary and tertiary education attainment shocks while controlling for inflation shocks using Bayesian VAR with a Minnesota prior for the period (Q1: 2008–Q1: 2022). We find that the deleterious impact of tertiary education attainment shock on upper youth unemployment is transitory (2.5 years) and less severe. After 2.5 years tertiary education attainment significantly reduces upper youth unemployment. The increase in unemployment among lower youths as a result of their tertiary education attainment is only significant for 5 years, with a severe impact between 1 to 2.5 years. This is expected in a highly competitive market labour market, as young new tertiary education graduates are associated with low experience and therefore take time to be absorbed. Secondary education attainment shock raises both lower and upper youth unemployment in the short and long run, with a severe impact on the lower youth labour force. We also find that persistent youth unemployment discourages young South Africans from pursuing both secondary and tertiary education; hence, youth unemployment in South Africa is primarily composed of young school leavers. Another intriguing finding is that the decisive impact of inflation shock on youth is transient and subject to a 54.4% threshold. Beyond this threshold, inflation exacerbates youth

unemployment and the impact is severe. According to our findings, it seems that South Africa's labour market still allows the youth labour force to hedge against unemployment risk through tertiary education attainment, with highly educated graduates having the best labour market prospects. In terms of policy recommendations, support for formal tertiary education in terms of funding, relevance, and quality is necessary to curb youth unemployment.

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