

# The Nexus Between Higher Education Expansion and Economic Growth in Ethiopia: An Empirical Examination

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## **Abstract**

Over the past three decades, Ethiopia's higher education system has undergone substantial expansion, marked by an increase in the number of universities from two to more than 100 and a surge in student enrollment from 48 000 to more than 400 000. Despite this growth, there is a paucity of research on the relationship between higher education expansion and economic growth, with the few quantitative studies that have been undertaken yielding inconsistent outcomes. This research study embraced endogenous economic growth theory, employed the Autoregressive Distributive Lag (ARDL) bound testing model, and used World Bank data from 1991 to 2021 to explore the relationship between economic growth (measured by GDP per capita) and the expansion of higher education (proxied by gross tertiary enrollment). Contrary to prevailing assumptions, the study uncovered an insignificant association between higher education expansion and economic growth. Unlike other studies, it used qualitative analysis to unearth the potential contributing factors and identified subpar educational quality, limited university autonomy, and constrained academic freedom as critical issues. It is recommended that policymakers in countries undergoing similar higher education expansion should not only focus on increasing the number of students, but also prioritise improving the quality of education, granting greater autonomy to universities, and ensuring academic freedom. These factors are crucial for higher education to effectively contribute to economic growth.

**Key words:** Higher education expansion, economic growth, ARDL bound testing model, Ethiopia

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**Résumé:**

Au cours des trois dernières décennies, le système d'enseignement supérieur éthiopien a connu une expansion substantielle, marquée par une augmentation du nombre d'universités, qui est passé de deux à plus de 100, et par une hausse du nombre d'étudiants, qui est passé de 48 000 à plus de 400 000. Malgré cette croissance, il existe peu de recherches sur la relation entre l'expansion de l'enseignement supérieur et la croissance économique, et les quelques études quantitatives qui ont été entreprises ont donné des résultats incohérents. Cette étude s'appuie sur la théorie de la croissance économique endogène, utilise le modèle ARDL (Autoregressive Distributive Lag) et utilise les données de la Banque mondiale de 1991 à 2021 pour explorer la relation entre la croissance économique (mesurée par le PIB par habitant) et l'expansion de l'enseignement supérieur (représentée par le nombre brut d'inscriptions dans l'enseignement supérieur). Contrairement aux hypothèses dominantes, l'étude a révélé une association non significative entre le développement de l'enseignement supérieur et la croissance économique. Contrairement à d'autres études, elle s'est appuyée sur une analyse qualitative pour mettre au jour les facteurs contributifs potentiels et a identifié une qualité d'enseignement médiocre, une autonomie limitée des universités et une liberté académique restreinte comme étant des problèmes cruciaux. Il est recommandé aux décideurs politiques des pays qui connaissent une expansion similaire de l'enseignement supérieur de ne pas se concentrer uniquement sur l'augmentation du nombre d'étudiants, mais de donner la priorité à l'amélioration de la qualité de l'enseignement, à l'octroi d'une plus grande autonomie aux universités et à la garantie de la liberté académique. Ces facteurs sont essentiels pour que l'enseignement supérieur contribue efficacement à la croissance économique.

**Mots clés :** Modèle autorégressif à retardement distribué (ARDL), expansion de l'enseignement supérieur, croissance économique, Éthiopie.

**Introduction**

Higher education is a significant investment in human capital, offering lifelong benefits to individuals and playing a crucial role in cultivating a skilled workforce capable of driving sustainable economic growth (Benhabib and Spiegel, 2005; Bloom et al., 2006; Chankseliani et al., 2021). However, the literature on African higher education presents contradictory perspectives on its impact on economic growth (Glewwe et al., 2004; Oketch and Schendel, 2014). Similarly, the few studies on Ethiopia's higher education system report inconsistent findings (Borojo and Yushi, 2015; Mengesha and Singh, 2022).

Ethiopia embarked on its modern or secular higher education journey by establishing the University College of Addis Ababa in December 1950. It initially enrolled fewer than 80 students and was staffed by a small group of non-Ethiopian teachers (Habte et al., 1963). In the early 1960s, the university received its Charter as a four-year degree-granting institution. Students enrollment increased to more than 450, with 60 staff members, including 20 Ethiopians (Ibid). By 1970, the university's student body had expanded to 6 000, with 437 faculty members, including 228 expatriates (Amare, 1988). During the Dergue regime (1974-1991), the higher education system experienced modest expansion, with the establishment of postgraduate schools and colleges across various regions. In the 1982/83 academic year, enrollment reached 16 117 (Ibid). However, Ethiopian higher education's true massification began in the late 1990s under the Ethiopian People's Revolutionary Democratic Front (EPRDF) (1991-2018) and the current regime. Enrollment skyrocketed from 48 000 in 1990 to more than 400 000 in 2022, with a significant increase in the number of public and private higher education institutions from two in 1990 to more than 100 in 2022.

The EPRDF's policy documents stated that the primary objective of the expansion of higher education was to contribute to the country's economic development within the framework of the Agricultural Development Led Industrialization (ADLI) development strategy. The government aimed to raise the higher education gross enrolment ratio to 22% to elevate Ethiopia's status to that of a middle-income country by 2025 (FDRE, 2012; MOE, 2010).

Qualitative studies on the Ethiopian higher education system have yielded inconsistent findings. While some of these note that its expansion has led to the introduction of new academic programmes at both graduate and undergraduate levels, increased enrollment of female students, expanded access to citizens residing outside the capital city, the establishment of supportive institutions, and enhanced employment opportunities for academic staff (Yallew, 2020; Areaya, 2010; Tessema, 2009), others highlight various interconnected challenges. These include quality issues, a shortage of qualified academic staff, sub-standard teaching and learning, poor research output, insufficient financial and material resources, a lack of autonomy, and limited academic freedom (Semela and Ayalew, 2008; Leqa, 2009; Tessema, 2009; Semela 2011; Bishaw and Melesse, 2017; Areaya, 2010; Woldegiyorgis, 2023). Furthermore, Tamrat and Teferra (2019) note that private higher institutions face financial constraints, regulatory restrictions, and related external challenges.

Few quantitative or econometric analyses have empirically examined the impact of higher education on Ethiopia's economic growth and those that exist produced mixed results. For instance, a World Bank study in 1996 showed that higher education made a significant economic contribution, with its private and social rates of return standing at approximately 25% and 14%, respectively (Saint, 2004). Mengesha and Singh (2022) argued that the secondary and higher education sub-sectors positively impacted economic growth. In contrast, Borojo and Yushi (2015) concluded that higher education enrollment has an insignificant effect on economic growth in both the long and the short run.

This brief review highlights the need for further research to inform policy decisions regarding the future of higher education in Ethiopia. Moreover, quantitative and qualitative approaches should be combined to offer a comprehensive empirical analysis of this issue.

Against this background, the study on which this article is based employed quantitative and qualitative approaches. On the quantitative front, the ARDL bounds test model was employed to examine the level of co-integration between higher education (proxied by the gross tertiary education enrollment ratio) and economic growth (proxied by Gross Domestic Product (GDP) per capita) in Ethiopia. The qualitative approach

involved a systematic review and synthesis of existing literature.

This article is organised as follows: Following the introduction, it presents a review of the overall and empirical literature. This is followed by a discussion on the quantitative methodology and the findings of the econometric analysis. The final part employs a qualitative approach to investigate the factors contributing to the insignificant relationship between higher education and economic growth in Ethiopia.

## Literature Review

### General Literature

Higher education has a rich history in many developed economies and is widely recognised for its significant contribution to economic growth (Schultz, 1961; Barro and Lee, 1993; Hanushek and WoBmann, 2010). Numerous studies have demonstrated that it produces a highly educated workforce equipped with advanced knowledge and skills and capable of driving innovation and applying newly developed technologies. Such employees are regarded as agents of change who respond to competition and technological advancements and address growing consumer demand for new products (Sianesi and Van Reenen, 2003; Santiago, 2008; Pillay, 2011).

Since the late 1950s, economists have explored the relationship between higher education and economic development using different theoretical models. The two prominent models in this regard are the augmented neoclassical growth theory (Romer, 1990; Mankiw et al., 1992) and the endogenous growth theory (Lucas, 1988). They posit that education has a positive effect on economic growth and attest to its role in long-term growth by increasing an economy's innovative capacity and facilitating the transmission and diffusion of knowledge required to implement new technologies (Benhabib and Spiegel, 2005).

Academics, researchers, national governments, and donors in developed countries have debated the relationship between education and economic growth. Key issues include which level of education (primary, secondary, or tertiary) should be targeted for development; effective budget allocations between these levels; designing education policies; and examining the association among educational expenditure, enrollment, and GDP. The literature on higher education in developing

economies also proposes several theories that suggest a symbiotic relationship between higher education and economic growth/development in these countries. Bloom et al. (2005) and Oketch and Schendel (2014) identify the following four significant theories:

- A) The human capital theory suggests that higher education generates both private and social returns through higher earnings for individuals and contributes to national economic growth due to increased productivity. This theory justified the expansion of higher education in developing economies during the early post-colonial period, particularly from the 1960s to the early 1980s.
- B) The endogenous growth theory suggests that in the context of a knowledge economy, highly-skilled workers are crucial for economic growth as they play a fundamental role in adapting and transferring technology. It argues that higher education produces positive externalities such as improved health, increased longevity, enhanced cognitive development in children, and reduced family size, contributing to workforce productivity and economic growth.
- C) The capability approach to development highlights the power of higher education in enhancing capabilities within a population. It posits that higher education allows students to pursue diverse objectives, including employment, strengthening citizenship, and ethical commitment to society. This approach assumes that expanding higher education leads to broader social impacts, such as strengthening democracy, promoting social cohesion, and fostering good governance, which in turn contribute to economic growth.
- D) Institutional theory considers higher education's impact on a wide range of institutions or collectives, including formal organisations and the social norms governing behaviour. It suggests that higher education can play a crucial role in producing skilled individuals who are able to build improved institutions, contributing to various social, political, and economic development outcomes.

These four theories collectively justify the significance and value of

higher education in developing economies. They highlight that it fosters human capacity-building, endogenous economic development, broader economic and non-economic development outcomes, and improvements in public and private institutions by producing competent graduates. However, it should be noted that the validity of these theories relies on several fundamental assumptions. As set out by Bloom et al. (2005), the World Bank (2009), and Oketch and Schendel (2014), they include:

- Quality education in higher education institutions;
- Sufficient access to primary and secondary education and quality education at both levels;
- Adequately-prepared secondary school graduates to enter higher education institutions;
- Equal access to higher education, regardless of income, gender, religion, ethnicity, place of residence (urban/rural) and other societal identities;
- Qualified faculty and staff with adequate academic resources to produce knowledgeable graduates;
- High-quality research to generate new knowledge and faculty members' ability to disseminate such knowledge to students; and
- Relatively higher budget allocations for higher education.

This article focuses on how the absence of these conditions affects the long- and short-term relationship between higher education and economic growth in Ethiopia.

### Empirical Literature

Numerous empirical studies have examined the relationship between education and economic growth using different variables to measure education or human capital, including enrollment rates; average years of schooling; education quality and systems; cognitive skills such as mathematics and science; and government spending on education as a percentage of GDP.

Unlike the consensus regarding the general theoretical approaches to the association between higher education and economic growth, empirical studies in developing and developed economies have produced inconsistent and controversial results. Benosa and Zotou (2013) point to

different and sometimes conflicting empirical findings in cross-country and country-specific analyses of the education-growth nexus. Similarly, Temple (2001) asserts that despite robust theoretical predictions, the empirical evidence on the long-term relationship between education and economic growth has been inconclusive. Hanushek and Woessmann (2009) also point to debate on the most appropriate indicators to measure education or human capital and suggest the use of cognitive skills rather than years of schooling. The authors (Ibid: 17) note that “cognitive skills generated in the school system lead to higher long run growth of economies”.

Studies on the relationship between higher education and economic development in sub-Saharan Africa have also produced inconsistent findings. While some establish no direct and significant relationship, others found a positive and significant association. For example, Barro’s (1996) cross-country study that included some sub-Saharan African countries found that male educational attainment, particularly at secondary and tertiary levels, significantly positively affected growth. He estimated that an additional year of male upper-level schooling raises the growth rate by a substantial 1.2 percentage points per annum. Psacharopoulos (1996) concluded that the private and social rates of return on investment in primary education were higher than those for secondary and higher education, suggesting that higher education is less relevant to economic growth than primary education. The findings of this study influenced national governments and donors to invest less in higher education until they were challenged by Teal (2011) and others scholars.

Oketch and Schendel’s (2014) review of 25 studies on the relationship between higher education and economic growth in sub-Saharan Africa, South Asia, and Southeast Asia also produced inconsistent findings. Some of the studies included in the review suggested that primary and secondary education yield greater economic benefits than higher education in lower-income countries and pointed to the lack of a significant relationship between the number of university graduates and economic growth. In contrast, others concluded that expanding higher education in African countries increases the growth rate of per capita income and contributes to economic growth. Yet other studies found that aid for higher education in middle-income countries stimulates

economic growth.

Similar studies on higher education in specific African countries have produced conflicting findings. For example, Omodero and Nwangwa (2020) found no causality effect between the higher education gross enrollment ratio and economic growth, and vice versa in Nigeria. Bloom et al. (2005) suggested that higher education in sub-Saharan Africa may accelerate technological diffusion, narrow knowledge gaps, ameliorate poverty, and maximise the region’s potential for economic growth. Similarly, Valero and Van Reenen (2019) found that an increase in the number of universities is associated with higher GDP per capita in a region. Other studies identified reverse causality, where economic growth leads to increased enrollment in higher education (Teal, 2011). Kyaw and Macdonald (2009) highlighted the difficulty of establishing a relationship between higher education and economic growth due to low enrollment rates in tertiary education in many sub-Saharan African countries. As discussed earlier, quantitative studies on Ethiopia also produced mixed results.

This review of the empirical research highlights the need for more country-based and cross-country studies to draw conclusive results and inform higher education policies, especially in developing countries. Our study focused on Ethiopia, a developing African economy that is heavily investing in its higher education system.

### Methodology

The study was guided by endogenous growth theory that focuses on the factors and mechanisms that drive long-term economic growth within a country. One of its central assumptions is that economic growth is primarily facilitated by internal processes inherent to the system itself. This theory was relevant as it emphasises education as a vehicle for human capital accumulation and treats it as a factor of production besides labour and capital (Lucas, 1988). Lucas argued that the labour force’s improved educational attainments enhance productivity and in turn, national economic performance (Ibid.).

The study employed time series econometric models that combine different variables to assess the relationship between higher education and economic growth. The analysis considered the World Bank dataset

from 1991 to 2021, focusing on Ethiopia's GDP per capita, Gross Fixed Capital Formation, Labour Force Participation, and Gross Tertiary Education Enrollment. Multiple imputation techniques were employed to estimate the missing values where data was missing for specific years. The selection of 1991 as the starting point was informed by the fact that it marked the beginning of the EPRDF regime after overthrowing the Dergue regime and the launch of massification of the country higher education system. As noted earlier, human capital can be measured using enrollment rates; average years of schooling; education quality and systems; cognitive skills or international test scores such as in mathematics and science; and government spending on education as a percentage of GDP. This study used enrollment rates in higher education as this data is relatively readily available in Ethiopia.

Many studies on economic development measure capital using Gross Fixed Capital Formation that measures the net increase in physical assets over a certain period, Capital Stock (the accumulated value of physical assets used in production), and Investment Expenditure (spending on new physical capital). This study employed Gross Fixed Capital Formation that is a common measure in many studies.

The specified econometric model incorporates a dependent variable, GDP Per Capita (GDP) along with three independent variables: Gross Fixed Capital Formation (FC), Labour force Participation (LR), and Gross Tertiary Education Enrollment Ratio (TE). Based on the theoretical premise and connecting GDP, FC, LR, and TE, the formulated model is as follows:

$$GDP = \beta_0 + \beta_1 FC_t + \beta_2 LR_t + \beta_3 TE_t + \mu_t$$

Where:

GDP = Gross Domestic Product Per Capita

FC = Gross Fixed Capital Formation

LR = Labour Force Participation rate

TE = Higher Education Enrollment Ratio

$\mu_t$  = Error term

All the variables in the model have the subscript "t" representing different periods ( $t = 1, 2, \dots, t$ ). The parameter  $\beta_0$  represents the intercept term, while  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$  denote the slope coefficients, all expected

to have positive signs. The model suggests that a country's economic growth, as measured by GDP per capita, is positively influenced by increases in capital investment, labour force participation, and tertiary education enrollment.

- **Capital (Gross Fixed Capital Formation):** This variable represents the total value of all new fixed investment made in a country's physical assets such as infrastructure, machinery, and buildings. A positive relationship implies that as the level of capital investment increases, the model predicts that the country's GDP will also increase. This aligns with the economic theory that suggests that adequate capital accumulation contributes to economic growth.
- **Labour (Labour Force Participation):** This variable represents the percentage of the working-age population that is either employed or actively seeking employment. A positive relationship suggests that an increase in labour force participation is associated with an increase in GDP. This is in line with the idea that a larger and more engaged workforce can contribute to economic output.
- **Human Capital (Tertiary Education Enrollment):** Tertiary education enrollment is often used as a proxy for the level of human capital in a country. Human capital refers to the workforce's skills, knowledge, and expertise. A positive relationship indicates that as more individuals enroll in tertiary education (such as universities and colleges), the model predicts a positive impact on GDP. This aligns with the notion that a well-educated and skilled population is a crucial driver of economic development.

As pointed out in the theoretical discussion, the above model reflects a holistic view of economic development that considers both physical and human capital as essential contributors to a nation's prosperity. However, it is important to note that while the model indicates associations, causation is a complex issue in economics, and other factors not included in the model may also influence variations in GDP.

### Empirical Model

The study employed the Autoregressive Distributive Lag (ARDL)-Bounds Testing model for co-integration (Pesaran et al., 2001) to

empirically investigate the relationship among the variables in the model specified above. It was selected due to its applicability to small sample sizes and its ability to handle endogenous regressors that are integrated of order one  $I(1)$  or order zero  $I(0)$  (Ibid). It suited the dataset used, which comprised a relatively small number of variables, 30 years of data, and one country, with endogenous variables and integrated of order one  $I(1)$ .

The ARDL bounds test is employed to examine the presence of a long-run equilibrium relationship among variables and estimate the associated short-run dynamics (Pesaran et al., 2001). The following standard procedures are followed: First, a unit root test is conducted to assess the stationarity of the variables and ensure that none are integrated at a level of two or more. Second, the lag-length criteria are determined. Third, the co-integration test based on the bounds test is applied to examine long- and short-run relationships between the variables. Lastly, residual and stability diagnostic tests are performed to assess the reliability of the econometric model. EViews 12 statistical software was used to analyse the data and administer the required tests.

**Unit Root Test:** Testing for stationarity is crucial as many time series variables exhibit unit roots or follow a random walk pattern (i.e., non-stationary) over time, primarily driven by stochastic trends. Such trended time series can potentially lead to spurious regression results and undermine the policy implications (Engle and Granger, 1987). In this study, the unit root properties of the variables were tested using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests. Variables that exhibit unit roots at the level are considered integrated of order zero  $I(0)$ , while those that become stationary after first differencing are regarded as integrated of order one  $I(1)$

**Table 1:** Result of the unit root tests

	Augmented Dickey-Fuller (ADF)	Phillips-Perron (PP)
GDP $I(0)$	-0.239406 (0.9227)	0.261494 (0.9722)
GDP $I(1)$	-3.570648 (0.0498)	-3.690668 (0.0387)
FC $I(0)$	-1.710656 (0.4162)	-1.695620 (0.4235)
FC $I(1)$	-5.985072 (0.0000)	-5.985272 (0.0000)
LB $I(0)$	-1.844583 (0.6584)	-2.074532 (0.5391)
LB $I(1)$	-4.810182 (0.0029)	-4.712224 (0.0037)
TE $I(0)$	-1.801414 (0.6797)	-0.235690 (0.962)
TE $I(1)$	-3.133240 (0.0347)	-3.096022 (0.0376)

Table 1 displays the unit root test results, presenting the T-statistics and corresponding P-values (in parentheses) calculated using EViews 12 software. The result of the unit root tests indicates that none of the variables are stationary at their levels, but after taking the first difference, all variables become stationary. Consequently, all variables are integrated of order one  $I(1)$ .

**Lag-Length Criteria:** Based on the unit root test results, which establish that all variables are integrated of order one, it is possible to apply the ARDL model. However, prior to this, it is essential to determine the optimal lag length. Five selection criteria are commonly employed to identify the suitable lag order for the model. In this study, EViews 12 automatically selected the appropriate lag length for the model.

**Table 2:** Lag-length Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	5.762024	NA	1.05e-05	-0.117468	0.069358	-0.057701
1	218.9401	355.2967	2.07e-11	-13.26267	-12.32854*	-12.96383
2	243.3695	34.20126*	1.26e-11*	-13.82464*	-12.14320	-13.28673*

Table 2 indicates the lag order selected by the five criteria (LR: sequential modified LR test statistic; FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion). Accordingly, the four criteria selected a

lag length of two years. This lag length was used to run all the required ARDL measures and diagnostic tests.

**Co-integration Test:** The assessment of co-integration is a crucial step to determine if a meaningful long-run relationship exists among the variables (Pesaran et al., 2001). This study applied the selected lag length and conducted the co-integration test within the framework of the ARDL bounds test. Three analytical tests were considered: The F-Bounds, long-run co-integration, and short-run dynamics tests.

**The F-Bounds Test:** The Bounds test provides F-statistics and upper and lower bounds based on critical values of 1%, 2.5%, 5%, and 10%. Under this test, the null hypothesis is that “no long-run relationship exists” between the variables. The criteria for accepting or rejecting this null hypothesis are as follows: a) if the F-value exceeds the upper bound, it indicates the presence of a long-run relationship; b) if the F-value falls below the lower bound, it suggests the absence of a long-run relationship; c) if the F-value falls within the range of the upper and lower bounds, the results are inconclusive (Pesaran et al., 2001).

**Table 3:** Result of ARDL Long Run Form and Bounds Test (F- Bounds Test)

Dependent Variable D(GDP)

Null Hypothesis: No Levels relationship

Test statistic	Value	Signif.	I(0) (lower bound critical value)	I(1) (upper bound critical value)
F-Statistics	8.642337	10%	2.72	3.77
K	3	5%	3.23	4.38
		2.5%	3.69	4.89
		1%	4.29	5.61

Table 3 presents the results of the F-Bound test, indicating that the F-statistics exceeded the upper bounds at the four significant levels. This means that long-run co-integration exists between the dependent and independent variables, providing evidence of a stable relationship.

**Long-run Co-integration:** The ARDL model was employed to assess the presence of a long-run relationship or co-integration between the dependent variable and each independent variable. Table 4 presents the results.

**Table 4:** Result of ARDL Long Run Form and Bounds Test (Long Run Model)

Dependent variable = GDP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FC	0.557186	0.261279	2.132535	0.0478
LB	0.690240	1.109802	0.621948	0.5422
TE	-0.119485	0.428597	-0.278781	0.7838

Table 4 displays the results of the long-run regression analysis. The coefficients of the two variables are consistent with the predictions, except for Tertiary Education Enrollment (TE). Gross Fixed Capital Formation (FC) positively and statistically significantly affects economic growth. The findings suggest that a 10% increase in Gross Fixed Capital Formation leads to a GDP increase of approximately 5.57% in the long run. Labour Force Participation positively impacts economic growth, although it is statistically insignificant. However, higher education proxied by Tertiary Education enrollment shows a negative and statistically insignificant association with economic growth. This finding aligns with a previous study that highlighted the insignificant relationship between higher education and economic growth in Ethiopia (Borojo and Yushi, 2015).

**Short-run Co-integration Model:** The ARDL model’s short-run dynamics enable an examination of how the variables adjust in response to changes in the short run. The coefficient of the one-period lagged error-correction term (CointEQ(-1)) measures the speed of adjustment to the co-integration relationship. The expected value for this coefficient is negative and statistically significant, and its absolute value should be smaller than one. These characteristics indicate a gradual convergence of the system towards long-run equilibrium values (Engle and Granger, 1987).



**Table 5:** Result of ARDL Error Correction Regression (Short-Run Model)  
Dependent Variable: D(GDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.223252	0.362955	-3.370256	0.0036
D(GDP(-1))	0.443903	0.105284	4.216254	0.0006
D(FC)	0.579469	0.190654	3.039370	0.0384
D(LB)	-1.879373	4.80880	-0.390820	0.7008
D(LB (-1))	6.6848802	5.530222	1.208777	0.2433
D(TE)	-0.167856	0.129174	-1.299464	0.2111
D(TE(-1))	-0.041820	0.150019	-0.278762	0.7838
CointEQ (-1)*	-0.349999	0.054882	-6.377289	0.0000
R-Squared	0.83			
Adjusted R- Squared	0.76			
F-Statistics	12.28578			
Prob (F-Statistics)	0.000003			
Durbin-Watson Stat	2.084856			

Table 5 demonstrates that the short-run model is valid, as indicated by the negative and significant coefficient value. The Error Correction Coefficient of -0.34 suggests that the model adjusts approximately 35% of the disequilibria within one year. However, the rate of adjustment is relatively slow.

Furthermore, Table 5 reveals that in the short run, GDP per capita for the previous period (GDP - 1) is a significant determinant of the current period's GDP per capita (GDP). A 10% increase in GDP from the previous period corresponds to an average improvement of 4.43% in GDP per capita. This finding aligns with the endogenous growth approach.

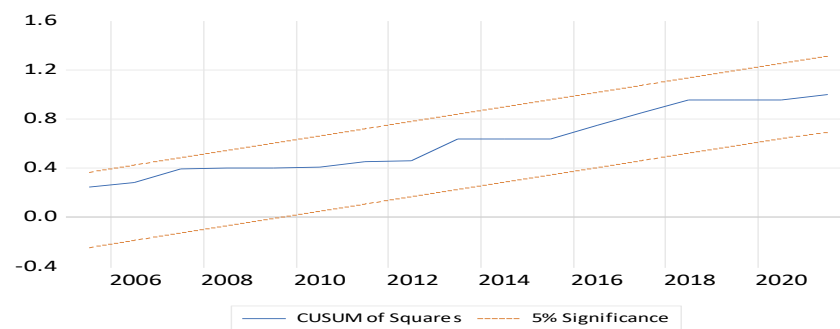
The coefficients for fixed capital formation show signs consistent with predictions. The results indicate that a 10% increase in gross capital formation in the short run leads to a GDP increase of approximately 5.79%. However, this is not the case for labour and higher education. Similar to the long-run co-integration results, only capital proxied by fixed capital formation exhibits a positive and significant impact on

economic growth in the short run. The finding also suggests that in the short-run, higher education expansion is not significantly related to economic growth.

**Residual and stability Diagnostic tests:** Diagnostic tests are commonly performed in econometric modeling and analysis to ensure the reliability and validity of the model. Residual diagnostic tests assist in evaluating whether the model assumptions are met and if the model accurately captures the underlying relationships within the data. Three diagnostic tests were conducted: normality of residuals, autocorrelation, and heteroscedasticity. A stability test was also performed. The results of these tests, presented in Table 6 and Figure 1, confirm the soundness and dependability of the model.

**Table 6:** Results of the Residual and stability diagnostic tests

Measure	Null hypothesis	Value (p-values)
Jarque-Bera Normality test	Ho: Disturbances are normally distributed	2.481858 (0.289116)
Breusch-Godfrey Serial Correlation LM test	Ho: No serial correlation up to 2 lags	F-statistic: 0.975996 (0.3995) Chi-square: 3.339296 (0.1883)
Heteroskedasticity Test Breusch-Pagan-Godfrey	Ho: Homoskedasticity	F-statistics: 0.439151 (0.9160) Chi-square: 6.417082 (0.8441)



**Figure 1:** Stability test

The above four tests confirm the suitability of our model to analyse the relationship between economic growth and three independent variables: Gross Fixed Capital Formation, Labour, and Higher Education Enrollment. The results obtained from these tests support the validity of the model as follows:

- The Jarque-Bera normality of residuals test validates the assumption of normality by demonstrating that the residuals follow a normal distribution.
- The Breusch-Godfrey Serial Correlation LM test indicates the absence of significant autocorrelation in the residuals, suggesting independence.
- The Breusch-Pagan-Godfrey heteroscedasticity test reveals no evidence of heteroscedasticity, indicating that the assumption of constant variance is satisfied.
- The CUSUM stability test shows that the coefficients of the model remain relatively constant over time, indicating stability.

The results from these residual and stability diagnostic tests collectively confirm the reliability and validity of the model, instilling confidence in the conclusions drawn from the analysis.

Based on the empirical analysis, it is evident that the econometric model employed in this study is reliable for drawing statistical inferences regarding the relationship between higher education and economic growth in Ethiopia. The findings suggest no significant long- or short-term effect or relationship between Ethiopian higher education and economic growth. The following section discusses the factors that could contribute to the lack of a significant and robust relationship between higher education and economic growth in Ethiopia.

#### **Possible Factors Contributing to the Weak Association Between Higher Education Expansion and Economic Growth**

The literature review noted widespread recognition of higher education's pivotal role in fostering social and economic progress. The expansion of higher education in Ethiopia aims to produce highly-qualified graduates to drive social and economic development in the country. However, the econometric analysis conducted in this study revealed no significant

long- or short-term relationship between higher education and economic growth in Ethiopia. This finding contradicts theoretical and empirical findings in many developed and developing economies. This section examines this enigma and identifies factors that could account for the insignificant and negative relationship between Ethiopia's higher education system and economic growth. Following the assumptions expounded in the theoretical discussion, two key challenges, namely, quality education, and academic freedom and autonomy are discussed. Given the influence of path dependency, it is important to briefly address the challenges confronted in earlier periods before exploring the difficulties encountered in the past three decades.

#### **Challenges Confronting Higher Education Before the EPRDF (1950-1991)**

As noted previously, modern higher education in Ethiopia spans only seven decades and has faced different challenges. Although the degree of these challenges may have differed, many persisted throughout the three regimes that governed the country. Studies reveal that during the imperial regime (1930-1974), they included: a) lack of coordination among higher education institutions, resulting in programme duplication and inefficient utilisation of human and financial resources; b) disparities between the country's human resources needs and the educational programmes offered by higher education institutions; c) the imbalanced composition of the student population in terms of regional, gender, and ethnic representation; and d) the absence of a well-defined national ideology to guide the connection between higher education and government development plans (Amare, 1988). The last challenge has been an issue throughout the history of Ethiopian higher education.

During the Dergue regime (1974-1991), critical challenges included: a) heavy government involvement in administrative and academic matters; b) revocation of universities' Charters, which guaranteed a degree of freedom and autonomy; c) mandatory indoctrination of Marxism-Leninism in all educational institutions alongside the use of dialectical materialism for analysis and interpretation of subjects; d) limited research engagement by scholars due to resource constraints and fears of reprisal for producing research critical of government policies; and e) inadequately qualified teaching staff (Amare, 1988). Bishaw and

Melesse (2017) also note that the Dergue regime exerted control over higher education institutions through increased security surveillance, repression of dissent, mandated courses on Marxism-Leninism, prohibition of student organisations, the appointment of senior university officers, and control of academic promotions.

### **Challenges Confronting Higher Education Since the EPDRF (1991 to Present)**

Significant changes were made to Ethiopia's higher education system during the EPRDF regime. The transformation became evident in the remarkable surge in the number of universities and student enrollment, leading to the massification of higher education. The system expanded across all regions, and the student body became more diverse. The establishment of a new legal framework governing the functioning of universities was another milestone.

However, despite these advancements, the higher education system has encountered challenges that have impeded its potential to make a substantial contribution to economic growth. Drawing on the literature, these challenges fall under two major themes: a) quality and b) academic freedom and autonomy.

#### **A) The Quality of Education in Ethiopian Higher Education Institutions**

During the EPRDF regime, the primary focus was on improving access to education across all regional states and increasing enrollment. Quality education was not a priority. Numerous studies conducted during this period have highlighted that the expansion of universities and the surge in student numbers harmed the quality of education. They revealed that universities were established and their academic programmes were launched without ensuring that teaching staff were appropriately qualified and that essential resources such as textbooks, reference material, libraries, computers, laboratories, lecture rooms, power generators, and accommodation were available (Saint, 2004; Semela, 2011; Akalu, 2014). Tamrat (2023) is also of the view that the quality of the higher education system during the EPRDF regime was undermined by excessive politicisation, corruption, ethnic strife, poor infrastructure and ill-prepared students, as well as ill-qualified, poorly paid, discontented faculty. While there are several determinants of

quality education in higher institutions, this article focus on three key aspects: the quality of faculty, the academic preparedness of secondary school graduates entering universities, and the teaching and learning process.

As briefly indicated in the literature review, in a higher education system, the adequacy and quality of faculty are critical factors in producing qualified graduates and research output. Unfortunately, the quality and composition of faculty in almost all universities were inadequate in terms of numbers and specialisations. Areaya (2010) noted that the standard set by the Ethiopian Higher Education Relevance and Quality Agency (HERQA) on the qualification composition of teaching staff in 2008 was 20:50:30 (Bachelor's, Master's, Doctorate). However, in 2009/10, the academic staff composition across all higher education institutions was 42.8% Bachelor's, 41.12% Master's, and 8.53% Doctorate holders. He added that 41.9% of academic staff did not qualify to teach at university level.

A decade later, Tadesse et al. (2020) indicated that while the Ministry anticipated a ratio of 0:70:30 (Bachelor's, Master's, Doctorate), the qualification composition in 2017/2018 was 27% Bachelor's, 58% Master's, and 15% Doctorate holder. This was a slight improvement, but still below the standard set by the Ministry. The challenge is, however, critical in newly-opened universities where there is hasty employment of poorly-qualified faculty with no training in teaching methodologies and inadequate disciplinary education (Areaya, 2010). Moreover, teachers generally have little voice in the policy/decision-making process in the higher education system (Leqa, 2009).

The academic preparedness of incoming secondary school completers significantly impacts the quality of higher education. A mark of 50% in the National School Leaving Certificate Examination is required for acceptance to higher-level institutions. Nonetheless, a noticeable number of ill-prepared students are entering the higher education system. Cases in point are presented in Table 7.

**Table 7:** Secondary school completers admitted without scoring the required marks

	2008/9	2009/10
Number of students who sat for National School Leaving Certificate Examination	86 238	85 610
Total number of students who scored above 50%	31 934 (37.03%)	38 901 (45.4%)
Number of students assigned to public universities	73 111 (84.8%)	78 822 (92.0%)
Number of students admitted to public universities without scoring minimum pass mark (50%)	41 117 (56.3%)	39 921 (50.6%)

Source: Ministry of Education (2010)

Table 7 shows that more than half the students admitted to universities during this period did not qualify for enrollment in higher institutions. Similarly, Teferra (2023) notes that during the 2013/14 academic year, the average score for all subjects in the national examination in Grade 12 was only 45.52%, signifying that more than half the students did not meet the requirements for university admission. The situation becomes even more alarming when considering subject-specific scores, with only 13.9% of students achieving 50% and above in physics, 37.6% in mathematics, and 36.3% in English (Ibid). The data highlights a significant gap in the academic preparedness of secondary school completers, contributing to the influx of ill-prepared students into higher education.

A concerning issue is the prevalence of students allegedly passing the National School Leaving Certificate examinations through corrupt and unethical practices. These include allowing students to cheat during exams and teachers providing answers to students during the examination. Tamrat (2023) highlights that this has become widespread, with schools, teachers, principals, regional authorities, and politicians implicated in encouraging such behaviour. Consequently, passing national examinations has become more of a political contestation among regional states' political leaders than a genuine manifestation of students' competence (Ibid.).

The results of the 2021/22 national secondary school-leaving examinations, conducted under the strict supervision of the Ethiopian

Ministry of Education, revealed the corrupt practices and the extent of deterioration in the Ethiopian education system over the past three decades. Only 29 909 (3.3%) of the nearly one million secondary school completers who sat the examination scored 50% or more to qualify for university admission. The Education Minister noted that the 2022/23 results point to the multiple challenges the education sector has been grappling with for an extended period. In a presentation to Parliament on 17 May 2023, the Minister revealed that, following an extensive evaluation of 47 000 schools throughout the country, a staggering 85.9% of elementary and middle schools, and 70.9% of high schools, were found to be sub-standard (*Addis Standard*, News, 24 May 2023).

A similar indicator of the declining quality of higher education in Ethiopia is the outcome of the recently introduced Nationwide Graduate Exit Exams – a national exam that every potential graduate must take after completing their university education but before being awarded their BA/BSc degree. According to a tweet by the Deputy Minister of Education on 15 July 2023, 150 184 prospective graduates sat for the examination in July 2023, with only 60 054 (40.65%) scoring above 50% (<https://twitter.com/fdremoe>). These results demonstrate the magnitude of the challenge confronting the Ethiopian higher education system in ensuring that graduates are adequately equipped with the necessary knowledge and skills.

The quality of teaching and learning plays a crucial role in producing graduates capable of contributing to economic growth. However, many Ethiopian universities continue to employ traditional teaching and assessment methods and are characterised by inflexible timetables, rote learning, a rigid lesson structure and a lack of instructional material and administrative support (Alemu and Schulze, 2012). While efforts have been made to improve the quality of teaching and learning, they have not always yielded the desired results (Tadesse et al., 2020). The adoption of student-centred teaching and continuous assessment faced challenges, as students and teachers raised issues (Alemu and Schulze, 2012) such as the fact that increased enrollment was not accompanied by increased capacity and resources, misalignment between different components of the curriculum, assessments that are unrelated to the learning objectives of the course, and quality-assessment efforts that focused on assurance rather than improvement (Semela 2011; Tadesse, 2014).

The above challenges apply to both graduate and undergraduate programmes. Typical issues in graduate programmes include the lack of adequate guidance and support for graduate students when working on their research papers, which results in plagiarism and poor-quality essays and theses.

### **B) Academic freedom and Autonomy in Ethiopian Higher Education Institutions**

The 2003 Education Proclamation grants Ethiopian higher education institutions autonomy to manage their administrative and academic affairs and also contains provisions on academic freedom. However, various studies note that interventions by the ruling party undermine the autonomy and academic freedom of faculty, staff, and students. This section discusses two interrelated issues: the erosion of faculty, staff, and students' academic freedom and the denial of universities' autonomy. As asserted by Saint (2004), minimal interference from the state is necessary for universities to fulfill their mandate of contributing to national development.

**Erosion of faculty, staff, and students' academic freedom:** The academic freedom of faculty, staff, and students has been restricted in Ethiopian universities for the past 30 years. Assefa (2007) highlights disturbing incidents since January 1993, including campus raids by the police, beatings, extrajudicial killings, mass arrests of students, dismissal of staff and students without due process or valid reasons, prolonged campus occupation by the security forces, and disruption of classes. He adds that the three major universities – Addis Ababa, Haramaya, and Jimma – are marked by a pervasive sense of insecurity among students, faculty, and staff. Zeleza (2013) documented arbitrary dismissal of faculty, including 40 professors in 1993 and the lack of tenure. Faculty involved in human rights activism faced arrest, and government cadres assumed control of all leadership positions within Ethiopian higher education institutions, raising serious questions about institutional independence and academic freedom (Ibid). The lack of academic freedom and autonomy negatively impact research output, lead to brain drain, and hamper academic and administrative leadership's day-to-day operations.

Asgedom and Hagos (2016) highlight that the lack of academic freedom has excluded faculty from decision-making, resulting in a lack of commitment to university objectives and research collaboration. Various factors contribute to this situation, including the fear of harsh retribution for criticising government policies, inadequate research facilities, heavy teaching workloads, limited access to research funds, and bureaucratic financial management systems (Assefa, 2007). This has resulted in low levels of research within universities, limiting the production of local knowledge, hindering critical thinking among faculty and students, and undermining the symbiotic relationship between research and teaching, research and policy, and research and development.

Another alarming manifestation of the lack of academic freedom is the prohibition on faculty and staff forming associations and negotiating their conditions of service, including salaries, benefits, privileges, and workloads. This has exacerbated the shortage of qualified teachers and researchers as it has contributed to significant brain drain. It also impacts job satisfaction and overall commitment to their roles within the university and discourages talented educators and researchers from remaining in the academic sector, losing valuable expertise and skills (Assefa, 2007; Akalu, 2014; Asgedom and Hagos, 2016). While precise data on this phenomenon is not available, it is evident that a considerable number of faculty members that travelled abroad for seminars and advanced education decided not to return, primarily because of the lack of academic freedom.

**The Loss of Higher Education Institutional Autonomy:** Ethiopian higher education institutions' lack of autonomy in managing their academic and administrative affairs has limited their ability to make independent decisions based on their unique needs and capacity. Assefa (2007) notes that, while the Higher Education Proclamation (351/2003) makes provision for charters, universities do not have such. He adds that the government's heavy involvement is evident in its interference in admission to graduate and undergraduate programmes, curriculum development, the establishment of new academic programmes, human resources management, financial management, and university leadership appointments. Public universities have limited power in decisions regarding student admission and placement. The governing

party recruits incoming students and determines the number of admissions to specific colleges or fields of study (Kahsay, 2012). For instance, prior to the 2019/20 academic year, universities were required to place 70% of their students in engineering and natural sciences and 30% in humanities and social sciences. This recently changed to 60% and 40%, respectively. Moreover, decisions regarding curriculum revision, establishing and closing academic programmes, and the launch of new graduate programmes are made by political leaders without due consideration of the resources and capacity available at individual universities (Saint, 2004; Melu, 2016).

The lack of autonomy is also reflected in the appointment of university leadership. Studies (Melu, 2016; Akalu, 2014) point to the lack of clear guidelines or procedures for such appointments. It would seem that, in many cases, political affiliations and connections to local and regional state political leaders play a significant role in university leadership appointments rather than merit. Party control has also been a feature of university governance, with the ruling party infiltrating universities by recruiting faculty as members and deploying its top officials to universities' governance structures. This has resulted in a lack of visionary leadership within higher education institutions, hindering their ability to promote quality enhancement (Saint, 2004). Centralised control and political influence have led to challenges in pursuing academic excellence and producing graduates that can contribute to national development.

Ethiopia's universities depend entirely on state funding for their recurrent and capital investment. No charter or other government policies empower them to implement programmes to self-finance their operations. Studies also indicate that universities do not have the autonomy to set salaries or link remuneration to performance (Saint, 2004). This has limited their ability to attract and retain top talent, as they cannot offer competitive salaries based on individual merit and performance. It has also undermined their capacity to implement incentive programmes that would motivate faculty and staff to excel and contribute to the institution's advancement (Kahsay, 2012, Akalu, 2014, Melu, 2016). Moreover, it has prevented institutions from acquiring necessary teaching and learning infrastructure.

Ethiopia's private higher education institutions are not immune to government regulations. As highlighted by Tamrat and Teferra (2019), they face numerous challenges, including a number of regulatory restrictions that limit the courses and programmes they offer. They also encounter financial and operational hurdles due to frequent and unstable regulations imposed by the ruling party. The shortage of qualified faculty and an increasing focus on the profit motive hinder the production of graduates capable of supporting the country's economic development (Ibid). These and related challenges have impeded the growth and development of private higher education institutions in Ethiopia, hindering their ability to offer diverse and high-quality programmes and produce skilled graduates.

The study's quantitative analysis and the above discussion reveal two interrelated factors that contribute to the lack of a significant long- and short-range relationship between higher education and economic growth in Ethiopia. The first is that the quality of education is undermined by various factors, including staff shortages and faculty's lack of appropriate qualifications, the ill-preparedness of secondary school graduates entering universities, and the failure to embrace modern teaching and learning approaches. The second is the restrictions imposed on students and staff's academic freedom and universities' autonomy.

## Conclusion

Based on an empirical investigation, the study points to the lack of a long- and short-term significant relationship between Ethiopia's higher education expansion and economic growth. This is due to two main factors, namely, the declining quality of higher education in the country, and the denial of university autonomy and academic freedom.

The study's results are preliminary and they could be complemented and triangulated by conducting similar studies using indicators like international test scores and government expenditure on tertiary education, and surveys that measure the challenges identified. Based on the findings, the following implications can be identified:

This study reinforces the existing literature that highlights the essential factors required to establish a robust relationship between higher education and economic growth. It confirms that merely

expanding higher education is insufficient to make a meaningful contribution to economic growth. Instead, equal attention should be devoted to enhancing the quality of faculty, incoming students, and the teaching and learning process. Autonomy and academic freedom are also essential.

These findings have significant implications, particularly for economically disadvantaged countries in Africa. They offer valuable lessons to those that focus solely on increasing enrollment without adequately considering the factors discussed in this article. The results underline the importance of a comprehensive approach to higher education, which involves not only increasing the number of universities and enrollment, but also enhancing educational quality, institutional autonomy and academic freedom.

Lastly, the study suggests that Ethiopian policymakers should address the identified challenges to revitalise the higher education sector and unlock its potential to make a significant contribution to the nation's economic growth.

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