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Estimating the Nexus between Internet Usage and Economic Growth in Somalia: Role of Hormuud Telecom Investment

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Abstract

Internet is becoming a driving force for Somalia's economic growth, creating jobs and enabling startups to get funds and communicate value. It is also permitting incumbent firms to benefit from international trade. This study examines the contribution of the Internet to Somalia's economic growth from 1999 to 2020. We measure economic growth by the real GDP growth rate, while the Internet penetration rate measures internet usage. The variables exports, imports, investment, and consumption, are considered to influence economic growth in Somalia. The study utilized the endogenous growth theory to develop an empirical framework, and Generalized Linear Model (GLM) was employed to estimate the parameters of the study. The presence of the unit root in series is tested while cointegration between the variables is examined using Engle-Granger Method. The results of this study reveal that internet usage positively contributes to economic growth in Somalia. We also found that consumption is the most significant driver of economic growth in Somalia, and international trade has a beneficial impact on the economic growth in Somalia. The study found evidence that the Internet supports all economic activities in Somalia as it is the means for communication, information exchange, and knowledge spillover. This study suggests Internet in Somalia is emerging and needs vast infrastructure investment. Such investment boosts internet penetration and reduces the cost of internet usage, which helps Somalia exploit industrial formation.

Keywords

Internet Usage, Economic Growth, Endogenous Growth Theory, Cointegration

1. Introduction

The emergency of modern information technology and the adoption of t the Internet have altered the means of production and market function. The Internet has become a strategic tool to expand trade and communicate with consumers' worldwide (Abdul Wahab et al., 2020). Information dissemination and economic growth are linked (Bahar, 2018; David, 2019); and there is even a telecommunication-led growth link (Ghosh, 2017; Haftu, 2019; Kumar et al., 2016; Vu, 2017; Wamboye et al., 2015).

The Internet gives the user access to a wide range of information influencing consumption and facilitating the distribution and production structure. The combinations of these aspects make the Internet crucial to the production factors of the country and the growth path (Jin & Jin, 2014; Salahuddin & Gow, 2016; Sassi & Goaied, 2013).

The economic benefit of the Internet is gigantic as it enhances inclusive growth of the economy and opens up the educational opportunity, increases productivity by coordinating the markets, helps innovation, and the increasing access to social services (Choi & Yi, 2009; Elgin, 2013; Zhang, 2013). As modern technology, the Internet accelerates growth through knowledge diffusion, product and process innovation, and the development of new production models. The Internet also improves the coordination between economic agents. It enables searching and sharing the information, which improves the ways firms operate, the household seeks opportunity, and the government interacts with citizens (Benhabib & Spiegel, 2005; Kelly et al., 2017).

Several studies attempted to find evidence for the economic benefits of the Internet as; Li and Wu (2020) studied the Internet, population size, and economic growth in China and revealed that the Internet increased economic growth by facilitating information exchange and promoting productivity efficiency. Tranos et al. (2020) found that telecommunication and internet adoption promote economic growth in the U.K. Abdul Wahab et al. (2020) stated that the Internet and trade openness significantly contribute to economic growth in Southeast Asian countries. Oladipo and Wynand (2020) found that internet access and mobile subscription positively contribute to Africa's economic growth and development. On the contrary, Haftu (2019) found a positive effect of mobile subscriptions and a negative impact of internet access on the GDP per capita in sub-Saharan Africa. Ramirez Lopez et al. (2019) argue that the Internet facilitated production and energy technology improvement, which enhanced the production process.

Latif et al. (2018) studied the role of ICT, another macroeconomic variable, in economic growth using panel data and found that ICT has positively contributed to the economy and that countries experienced a significant economic gain from the Internet and telecommunication. Das et al. (2018) examined the causal relationship between ICT, financial development, and economic growth in low-income and lower-middle-income countries and emphasized that ICT penetration positively

impacts economic growth. Paunov and Rollo (2016) studied the contribution of the Internet to innovation and productivity in 117 emerging and developed countries, and they found that Internet has a beneficial impact on firm productivity. Cirera et al. (2016) confirmed the contribution of ICT to innovation using data from six African countries but did not find any evidence of the innovation's contribution to productivity. Salahuddin and Gow (2016) studied the Internet's impact on economic growth in South Africa and found a positive and long-run relationship between the Internet and economic growth.

Timmer et al. (2011) found that internet usage positively affects economic performance by promoting labor productivity. A large number of the economic literature, Indian and Siegel (2005), Draca et al. (2007), Van Reenen et al. (2010), Biagi (2013), Cardona et al. (2013), and Bertschek et al. (2015) stressed the significance of the Internet to economic activities in the developing countries.

Africa's internet economy is projected to increase about 5.2% of its GDP, approximately 180 billion in 2025 and 720 billion in 2050. The internet growth in Africa is attributed to the enhancement of internet quality and improvement of the access and connectivity of the Internet. In 2020, Africa's Digital economy totaled 115 billion, while the GDP of the continent was 2.544 trillion, which makes the contribution of the Internet to the GDP 4.5%. These figures are a dramatic increase from 2019 when the Internet contributed to 3.9% of African GDP, equal to 99.7 billion (Google, & International Finance Corporation, 2021).

Despite the recent growth, access to the Internet in Africa is still lagging behind other parts of the world. In 2020, the internet penetration rate in Africa was 43%, which shows that 4 of each ten people have access to the Internet compared to the global internet penetration of4% (Faria, 2021). In Somalia, internet access is deficient and limits growth opportunities. According to World Bank data, internet access in Somalia is below other African countries. In 2015 1.76% of the population had access to the Internet; in 2016, 1.88%, while in 2017, 2.04% had access to the Internet. The data also presented that Somalia's average mobile cellular subscription in 2015 was 42.29%, in 2016, 46.9%, and in 2017, 48.79 (World Bank, 2022).

In Somalia, Hormuud Telecom is the country's biggest internet provider. One of the primary goals of Hormuud is to extend internet access in the nation and provide the Somalis population with an inexpensive, stable, and fast network. Hormuud also helps the population play a part in global markets and connect to the rest of the world. Hormuud internet also brings economic benefits as it facilitates a global opportunity. Professionals in Somalia also take advantage of international career chances.

It is well documented that the Internet has been an essential source of information and the distribution channel that promotes a firm's productivity. The lack of access to the Internet is detrimental to technological advancement and economic growth (Kenny, 2003). Limited access to the Internet continues to be a challenge restricting developing countries from advancing to the growth trajectory (Mokhtar et al., 2020; Bowles, 2012; Elgin, 2013; Kelly et al., 2017; Zhang,

2013; West, 2015; Delawari, 2019). Somalia needs to consider internet development and set a policy promoting the immense growth of internet usage and the development of the necessary infrastructure. Such initiatives need a steady understanding of the connection between internet usage and economic growth through empirical definition and further investigation. This study aims to examine the relationship between internet usage and economic growth in Somalia during the last decades. The second section of this paper gives an empirical and theoretical model, the third section presents econometric methods, the fourth section gives the result and the discussion, and the final section provides the conclusion and the policy implications.

2. The Empirical Model

This study applied endogenous growth theory, which postulates that economic growth is driven by knowledge spillover, human capital, investment, and innovation (Romer, 1986).

We assume that the Internet plays a crucial role in the diffusion of knowledge in the economy. The Internet is a key source of information and a tool to retrieve key ideas used as input for innovation (Aghion et al., 1998; Lucas Jr., 1988). Internet influences economic growth via various channels like providing information at lower cost, increasing competition and innovation, and helping corporations gain a model communication network that assists the growth. A number of studies applied endogenous growth theory to examine factors that promote economic growth (Thach, 2020; Sriboonchitta et al., 2019; Briggs & Nguyen, 2019; Kreinovich et al., 2019).

Following the Barro (1997) growth equation, economic growth can be set as a function of

$$y = f\left(I, HC, K, In\right) \tag{1}$$

Y is output, $H.C.$ is human capital, and K is knowledge and innovation. Barro's growth equation can be modified to incorporate the internet contribution of the two economic growths. This study used the modified model of Choi and Yi (2009) to construct the following empirical model

$$\begin{aligned} \ln GDP_t = {} & \beta_0 + \beta_{IU} \ln IU_t + \beta_{Invest} \ln Invest_t + \beta_{Exp} \ln Exp_t \\ & + \beta_{Imp} \ln Imp_t + \beta_{CONS} \ln CONS_t + \ln \varepsilon_t \end{aligned} \tag{2}$$

Y is economic growth, $I.U.$ is internet usage, $Invest.$ is the investment, Exp is export, Imp is Import, $CONS$ is consumption, t is time, and ε is the error term. A generalized Linear Model (GLM) is used to estimate the parameters in the model. GLM method is preferred vis-à-vis its ability to generalize linear regression and allows linear models to be associated with the dependent variable through link function. It also allows the extent of the variance to the function and its estimated value. Furthermore, it can establish a linear relationship between the variables while their underlying relationship is not linear, which is done through the link function.

The GLM estimators are the maximum likely estimators established under the category of the Linear Exponential family (LEF). It includes the number of estimators for the different data. It includes Gaussian used for the normal data; Inverse Gaussian applied to the continuous data, the binary data uses the Bernoulli, Poisson and negative Binomial is employed to count data, and Gamma is used to the duration data. GLM is the fundamental generalization of the nonlinear least squares, and it well suits the nonlinear models that homoscedastic additive errors. GLM estimators are also optimal for that data with inherent heteroscedasticity that must be modeled. GLM estimators $\hat{\theta}$ optimize the log-likely hood:

$$Q(\theta)=\sum_{i=1}^{N}\left[a\left(m\left(X_i,\beta\right)\right)+b\left(Y_i\right)+c\left(m\left(X_i,\beta\right)\right)\right] \tag{3}$$

where $M\left(X,\beta\right)=E\left(y\mid x\right)$ represents the conditional mean of the *y*. *a*(.) and *b*(.) represent the various number of LEF, where *b*(.) is the normalizing constant. The GLM estimators, Poisson, the mean equals to variance $a\left(\mu\right)=-\mu$ and $c\left(\mu\right)=\log\left(\mu\right)$. Referring to the definition of these two functions, the mean and the variance are $E\left(y\right)=\mu=-a'\left(\mu\right)/c'\left(\mu\right)$ and $Var\left(y\right)=1/c'\left(\mu\right)$. For the Poisson, $a'\left(\mu\right)=1$ and $c'\left(\mu\right)=1$, giving that $E\left(y\right)=Var\left(y\right)=\mu$.

GLM are preferred because of their consistency in addition to the correct specification of the conditional mean function, $E\left(y_i\mid x_i\right)=m\left(X_i,\beta\right)$. The failure to precisely estimate the variance function leads to applying the robust estimate of the variance and covariance matrix estimators (VCE). To estimate the model's parameters using GLM, we must specify the leaner exponential family and the link function, and in this study, the Gaussian family and the identity link function are applied.

3. Econometric Methods

3.1. Phillips-Perron Unit Root Test

The unit root must be tested in the time-series data to identify the series generation's characteristics and process. The process is crucial to the ability of the model to forecast future economic events. If the series has no constant variance and no unit root, then the series is stationarity, and the shocks disappear over time. None stationary series follows the random walk, presets stochastic trend, and does not return to the deterministic path. Moreover, the variance of the series is time-dependent, increasing over time and lenient random shocks. Several statistical methods check the unit root's presence and the series' stationarity.

This study uses Phillips-Perron unit root test. This method of the unit root test is different from other methods by serial correlation and the heteroscedasticity assumptions. Phillips-Perron unit root test is an extension of the Augmented Dickey-Fuller (ADF) test where heteroskedasticity and the serial correlations in the error term are parametrically corrected. On the contrary, Phillips-Perron method is none parametrically corrected.

To test unit root, Phillips-Perron estimates this equation:

$$\Delta y_{it} = \alpha_0 = \pi y_{t-1} + \beta t + \varepsilon_t \quad (4)$$

The test statistic of the Phillips-Perron unit root test is modified statistics of the Dickey-Fuller tests, which is strengthened to serial correlation using consistency covariance estimator in the heteroskedasticity and the autocorrelation (Newey & West, 1987).

3.2. Engle and Granger Cointegration Test

The cointegration analysis is significant in the time series data to cope with the problem of the none sense regression and to assure the existence of the causal relationship between the none stationary variables. So, time series cannot be cointegrated, making cointegration inherently multivariate.

Engle and Granger (1987) suggested a method to test the null hypothesis of no cointegration between a set of $I(1)$ variables in a single equation. The first step is calculating the coefficients of the set of $I(1)$ variables using Ordinary Least squares (OLS). The second step is to test the unit root of the residuals using ADF. The rejection of the null hypothesis presents evidence of cointegration.

The equation of the cointegration of $I(1)$ two variables is:

$$x_{1t} = \beta_0 + \beta_1 x_{2t} + u_t \quad (5)$$

While the cointegration of u_t is $I(0)$. We conclude that x_{1t} and x_{2t} are not cointegrated If $\hat{u}_t$ Has unit root. Autoregression of the residuals is carried out:

$$\Delta \hat{u}_t = \rho \hat{u}_{t-1} + v_t \quad (6)$$

Equation (6) has no intercept, refereeing to the fact that residuals in the regression model have zero mean.

3.3. Data Source and the Measurement

This study examines the relationship between economic growth and Internet use from 1999 to 2020 in Somalia. The economy is commonly measured by the real GDP, which is the sum of the total output values in a given period while accounting for price changes (Skare & Stjepanovic, 2013; Stankovska et al., 2016; Verbic & Polanec, 2014). The GDP data is obtained from the National Account of the Main Aggregate Analysis. Internet usage is measured by the internet penetration rate, which is the percentage of the population that has access to the Internet (Oladipo & Wynand, 2020). The exports and imports are measured by the value of goods and services exported or imported in the U.S. dollar. Consumption is measured by the value of the goods and services purchased by the household and the government. Investment is the total expenditure on the capital used to produce goods and services. The data on the Internet, exports, imports, investment, and consumption is obtained from the World Development Indicators (WDI), the World Bank database.

3.4. Summary of the Statistics

The summary of the statistics of the variables is presented in the below section,

where the mean, standard deviation, maximum value, and minimum value are calculated. Table 1 shows that the average growth rate of the GDP is 2.79% per year which is a significant growth rate in comparison to the countries in sub-Saharan African countries. The maximum economic growth that Somalia reached in the last three decades was 3.89% within the recent year, while the lowest growth rate ever experienced in Somalia was 1.84%, which most severe decline of the economy resulting from external economic shocks.

The Inter usage measures the percentage of the population that access internet shoes. An average of 0.67% of the population has access to the Internet, while 1.5% is the highest internet penetration rate in Somalia. The lowest rate of internet penetration in Somalia was 0.0014%. Export which plays a primary role in the economic growth of Somalia has an average of 0.30 billion dollars, where the maximum amount of export in Somalia was 0.324 billion, and the lowest ever export of Somalia was 0.260 million, showing Somalia is a small country in the internal economy. Somalia's economy depends on the international value chain, where an average of 1.67 billion goods is imported yearly. The immense amount of the imports was 1.69 billion, whereas the minimum imports were 1.60 million showing that Somalia is an imported dominant economy. Final consumption is a crucial economic driver in Somalia. The average final consumption in Somalia was 81.3 billion, where the maximum value of the consumption was 82.9 billion, and the minimum was 80.66 billion. The capital investment has an average of 20 million per year, while the lowest investment undertaken in Somalia was 18.30 million, and the highest was 20.68 million per year.

Figures 1-6 show the time series of the variables of this study. Figure 1 shows the GDP growth rate of Somalia every year from 1999 to 2017. Somalia's economy is a market system where the state has a minimal market function, and it benefits the economy as only market forces drive it. The GDP growth rate has been stable and constant over the last decades, where external shocks such as droughts and subsequent floods wreck the primary economic sectors and drag the economy. Somalia also primarily relies on foreign aid and the unilateral transfers that give budget and non-budget support, which has steadily increased in recent years. According to the World Bank (2022), the private sector is vital to economic growth, where the real estate industry plays a key role.

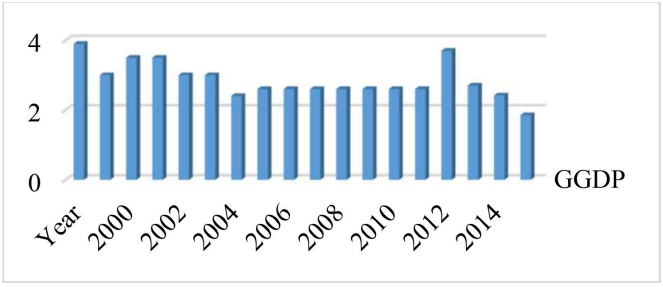
The economic growth in Somalia swings and such fluctuation is attributed to

Table 1. Summary of the descriptive statistics.

Variables/Statistics	GDP (%)	I.U. (%)	Exp (Billion)	Imp (Billion)	CONS (Million)	Invest (Million)
Mean	2.79254	0.67039	0.30424	1.67510	81.42543	20.0424
STD	0.43783	0.57022	0.01660	0.02611	0.558382	0.57259
Max.	3.69999	1.50000	0.32425	1.69354	82.97620	20.6849
Min.	1.84870	0.00150	0.26065	1.60116	80.89733	18.3677

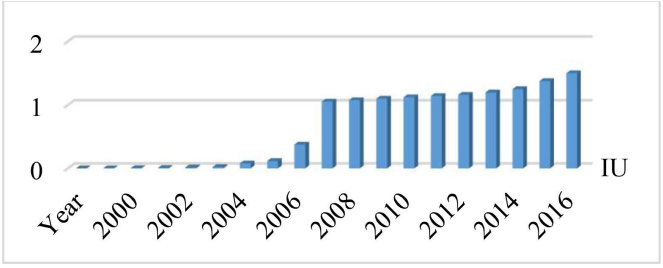
Source: Author (2022).

the dependence on rainfed agriculture and the natural disaster constraint. Figure 2 shows that internet usage in Somalia gradually increased as the number of people accessing the Internet grew. The surge in internet usage in Somalia is attributed to the rising per capita income, competition in the telecom industry, improved political stability, and education development. Somalia has a substantial



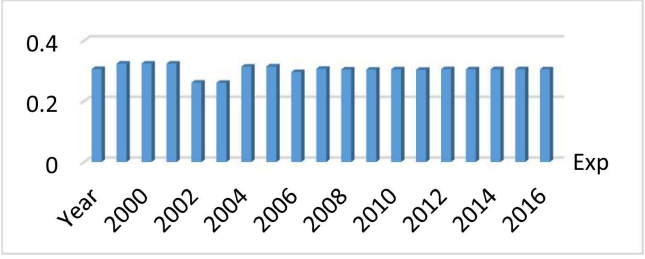
Source: Author (2022).

Figure 1. GDP growth rate.



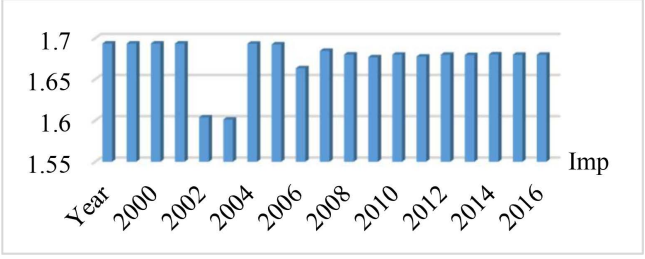
Source: Author (2022).

Figure 2. Internet usage.



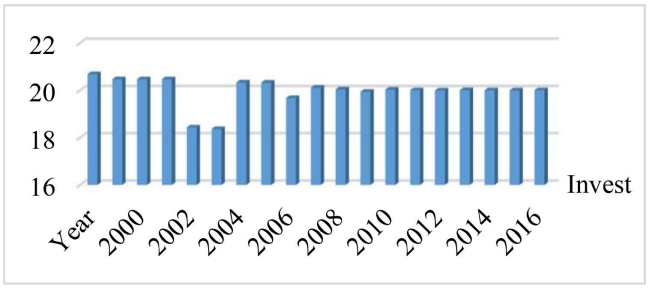
Source: Author (2022).

Figure 3. Export.



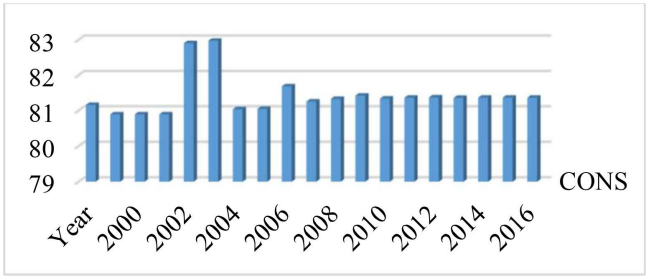
Source: Author (2022).

Figure 4. Import.



Source: Author (2022).

Figure 5. Investment.



Source: Author (2022).

Figure 6. Consumption.

mobile subscription which helps many people access the Internet. In the last two to five years, more than 2.2 million Somalis got access to the Internet and cheers to the telecommunication companies that reduced bandwidth costs and upgraded the performance.

Figure 3 shows the export variation of Somalia during the period considered in this study. Somalia exports agricultural products such as crops and the life sock to the neighboring and Gulf countries. The value and volume of export in Somalia were stable, and low livestock continues to be the largest exported produce in Somalia and, often, is negatively affected by climate-borne diseases, which lead to an embargo from the importing countries. Somalia also exports a limited amount of fruits and crops. The export of Somalia is hampered by several issues, including lack of industrialization, absence of the quality standardization procedure, and poor infrastructure exacerbated by the state's inability.

Figure 4 shows the import of Somalia from 1999 to 2017. Somalia imported a large number of goods and services from overseas. Food items, capital goods, technological products, transportation, and even health and education services are imported to Somalia. The imports make up about a third of the Somalis' economy, which is not unexpected since the country has no solid industrial produce to substitute such imports. The import value of Somalia is mainly affected by the internal market prices, the movement of the dollar values, and the oil prices. Somalia's formal currency vanished, and the prices are quoted in dollars making local prices high. Imported goods offer consumers a variety of goods and the freedom to choose but also create jobs in other countries and sabotage industrialization efforts in Somalia.

Figure 5 depicts the investment of the capital, which is machines, buildings, and the durable goods used for producing the goods and their long-term use. Investment in Somalia has been rising in recent years due to the expansion of the banking industry. The upsurge in the investment is driven by financial inclusion and the mobile money service that Somalia uses more efficiently. Investment plays a substernal role in economic growth where the investment's rise is linked to increased production. Private sector development is also a primary contributor to the rise in investment undertakings.

Figure 6 shows the final consumption, which combines household and government consumption. Domestic consumption in Somalia is attributed to the increase in income due to the economy's improvement, cash flow from Somalis abroad, and government spending, which has been considerable in recent years. An outward shift of the aggregate demand motivates the rise in output and employment, which has a positive spillover to economic growth. Another hand, the rise in consumption leads to inflation, which will negatively affect economic growth in the long run.

3.5. Philip-Peron Unit Root Method

The unit root test in series was performed using the Phillip-Peron method in Equation (4), and the result is presented in Table 2. We reject the null hypothesis, series has no unit root, and the result shows that series, GDP, I.U., and Invest have unit roots and are not stationary at the level. The variables ΔGDP, ΔI.U., and ΔInvest were differenced at the first difference, and we conclude that these series are stationary at the first difference. We found that the variables Exp, Imp, and CONS have no unit root and are stationary at the level. The unit root test results show that variables GDP, I.U., and Invest are integrated with order one $I(1)$ in Somalia. All the variables that are integrated in order one need to be regressed to examine if they are cointegrated. So, we test the cointegration using

Table 2. Phillip-Peron unit root test.

Variables	Lag length	Test Statistics	C. Value (5%)
GDP	(1)	−2.788	−3.600
ΔGDP	(1)	−4.997	−3.600
IU	(1)	−1.988	−3.600
ΔIU	(1)	−11.966	−3.600
Invest	(1)	−3.190	−3.600
ΔInvest	(1)	−4.772	−3.000
Exp	(1)	−3.252	−3.000
Imp	(1)	−3.041	−3.000
CONS	(1)	3.105	3.000

Source: Author (2022).

the Engle-Granger cointegration approach.

3.6. Cointegration Test

Cointegration analysis shows the long-run relationship between the two or more unit root variables. It implies the co-movements of these variables in a stochastic trend. Long-run relation is explained by the concept of the equilibrium relationship in economic theory, which exists when unit root variables have a stationary linear combination. This study undertook the cointegration analysis using Engle-Granger's Two-Step Method, a cointegration theorem similar to the error correction mechanism (ECM). In this method, cointegrated variables can be presented (Engle & Granger, 1987). The error term of the two variables, $\varepsilon_t = x_{1t} - \beta x_{2t}$ in regression model provided uses the information to determine whether the system moves to equilibrium. The previous value of the error term $\varepsilon_{t-1} = x_{1t-1} - \beta x_{2t-1}$ showed the next direction of the movement to the exogenous variables. We estimated Equation (5) and Equation (6), and the result is presented in Table 3.

The result in the table shows that test statistics, $Z(t)$, is more significant than the critical value, leading to the rejection of the null hypothesis of no-cointegration. MacKinnon's approximate p-value for $Z(t)$ is significant, evidencing the presence of cointegration. The result shows that economic growth (GDP), Internet Usage, Investment, Export, Import, and Consumption have a long-run relationship and establish equilibrium in the long term in Somalia.

4. Result and the Discussion

The model parameters of this study were estimated using the Generalized Linear Model (GLM) presented in Equation (2), and the result is presented in Table 4. The result demonstrates that all variables are significant at the significance level

Table 3. Engle-Granger test.

Test Statistics	Critical Value 1%	Critical Value 5%	Critical Value 10%	P-Value
−4.002	−3.750	−3.000	−2.630	0.0014

Source: Author (2022).

Table 4. Generalized Linear Model parameters.

Variables	Coef.	Std. Err.	Z Statistics	P-Value
lnGDP	−471.681	35.37868	−13.3324	0.0182
lnLIU	0.057307	0.002289	25.02765	0.012
lnExp	0.881144	0.041794	21.08295	0.035
lnImp	1.707417	0.2806744	6.083266	0.0503
lnCONS	11.23347	0.7808551	14.38611	0.015
lnInvest	0.027918	0.000425	65.68941	0.0502

Source: Author (2022).

of (5%) have statistically different from zero. The result indicates that Internet Usage, Export, imports, consumption, and investment positively contribute to the output growth of the economy. The model errors are examined, and we found that model has no heteroskedasticity and autocorrelation. The heteroskedasticity is examined using Breusch-Pagan method, and we fail to reject the null hypothesis showing no evidence of heteroskedasticity. The autocorrelation was also tested through Breusch Godfrey, and we did not reject the null hypothesis of no autocorrelation at 5%the significance level.

The result of the model parameters shows that internet usage has a significant positive contribution and that a 1% increase in internet users leads GDP to increase by about 0.05%. The result shows that Internet has a significant role in the economy of Somalia, similar to the countries in the world. The Internet influences economic growth as it alters how people work and organizes the flow of information and ideas. Intern penetration in Somalia has spearheaded the modernization of the economy and rejuvenated traditional business activities. The Internet empowered businesses in Somalia with the fundamental transformation that spans the virtual value chain at all levels and business types. The Internet also shifted how a product is designed, produced, and distributed as well as the wholesale change and the reach of the consumer. The Internet provides small and medium enterprises with a dynamic supply chain and global workforce.

The Internet created for Somalia a conducive environment that motivates entrepreneurship and innovation, leading to internet-related growth. The Internet helped Somali startups gain access to the capital, market, and communicate value which boosted sales and business sustainability. In this way, the Internet is a strong catalyst for job creation in Somalia. Although Internet has eliminated some traditional jobs, it is strongly believed that the Internet is a net job creator in Somalia and Africa. A part of the job created by the internet service provider (ISP) for engineers, sales personnel, and the technicians that offer internet products and services also created a job in other industries such as the online business. According to McKinsey's global SME survey, Internet has created 2.6% of every job destroyed.

Internet in Somalia is a valuable resource for teaching and research in the education sector. It has facilitated students in Somalia access to an excellent educational base worldwide and retrieves knowledge from the nurtured universities and institutes. This exercise has accelerated knowledge access which promoted skill upgrade knowledge acquisition. Internet is also a magnet for Somali universities to attract talents from the globe and bring Somalia to train young professionals. Human capital development via internet access helps the economy increase productivity and process efficiency. Internet in Somalia is in an emerging stage, and people are still unable to access it due to the cost and availability, which is an issue in many parts of the country.

Some other factors contribute to the economic growth of Somalia. Export contributes positively to the economic growth in Somalia, and the result shows that an increase in export to 1 billion leads economic growth increase of about

0.88%. Somalia exports a limited volume of the primary product and livestock, which is restricted due to the absence of infrastructure and lack of policy and strategy promoting the export. Industrial development, energy price, skills, and capital stock are prerequisites for export development in Somalia, and without these factors, export development is not expected any time soon.

Import plays an essential role in the economic growth of Somalia. The increase in imports to 1 billion causes economic growth to increase by about 1.7%. Somalia imports consumer and capital goods from the outside, and the food items, raw materials, and service products are all imports. A large amount of Somalis capital goes overseas, and Somalia gets everything from international economies. It evidences the benefits of trade and global interdependence. Imports create jobs in Somalia, bring raw materials for industrial use, and transfer technological know-how.

Domestic consumption is a crucial driver of economic growth in Somalia. The increase in consumption by 1 million in Somalia leads the economy to grow about 11%, making consumption the most significant contributor to the economic growth in Somalia. Consumption creates demand for local produce and imported goods, leading to employment and income generation in the economy. Many families in Somalia rely on money sent from foreign countries for consumption. Government consumption also plays a significant role in the rise of consumption. Government spending increased in Somalia, which also significantly increased final consumption.

The investment promoted economic growth in Somalia. The result shows that every million invested in Somalia brought about 0.027% of the economic growth. The private sector invests mainly in Somalia, especially in telecommunication, banks, and accurate estimate. The improvement of the political stability, competition in the financial industry, and the reform of the institutions in Somalia are primary facilitators of investment implementation in Somalia. Limited investment contribution is attributed to the absence of the public investment infrastructure, shaded legal system, and bureaucratic red tape in Somalia.

5. Conclusion

This study examined the contribution of the Internet to economic growth in Somalia. The analysis of this study covered from 1999 to 2020 using time series data from Somalia. This study used economic growth, internet usage, export-import, consumption, and investment to measure the contribution of the Internet to economic growth. The study employed endogenous growth theory to develop an econometric model measuring the relationship between the variables. The general linear model is utilized to estimate the model parameters. The presence of the unit root is examined using the Phillip-Peron method.

The cointegration between the variables is tested using the Engle-Granger method. We found that variables GDP, internet usage, and investment have unit roots at the level, so it needed to be differenced to remove the unit root. We also

found that variables are cointegrated and establish a long-run equilibrium relationship. The diagnostic analysis of the model showed that the model is homoscedastic and has no autocorrelation.

The findings of this study show that Internet has a positive and significant contribution to the economy in Somalia. We also found that consumption is Somalia's most significant driver of economic growth. Imports and exports also contribute a substantial portion of Somalia's economic growth, indicating that Somalis benefit from its presence in the international markets. This study also found that investment has minimal contribution to Somalia's economic growth.

Despite the growth of internet penetration and its significant contribution to Somalia's economic growth, Internet access is still limited both in percentage and the absolute number of the population. Internet telecommunication and mobile subscription investment is required to increase internet penetration. It reduced the internet telecommunication cost, boosting Somalia's economic growth by promoting a digital economy. International trade plays a key role in Somalia's economy, and the Internet is a foundation for the value chain of the export and supply chain of imports, so the sustainability of the Internet should be given great care as a minor outage on the internet cause excessive economic loss.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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