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Response Of Economic Diversification To Gender Inequality: Evidence From Nigeria

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Abstract: This study investigates the imperatives of gender equality in expanding the economic base of Nigeria, a country that has long remained a mono-product economy dependent on oil revenue. The purpose of this study is to explore how gender inequality affects economic diversification and to suggest policy recommendations to enhance gender equality and economic growth. The methodology employed includes the Engel-Granger and Error Correction Model within an endogenous growth framework. Data were sourced from relevant secondary sources such as textbooks, journal articles, and institutional reports. Findings from the study indicate that existing gender inequality negatively impacts Nigeria's economic diversification by reducing the potential pool of human capital and promoting opportunity gaps. Specifically, the study reveals that increased female self-employment, a higher ratio of female to male labour force participation, and a reduction in female vulnerability in employment are essential for policy formulation. The conclusion emphasizes the necessity for sustained efforts to eliminate patriarchal tendencies and enhance social protection mechanisms to reduce the vulnerabilities faced by women. These measures are crucial for improving gender equality, which in turn can significantly contribute to economic diversification and growth in Nigeria.

Keywords: Diversification, Economic Growth, Gender Inequality, Gender Parity, Vulnerability

JEL Classifications: J16, O1

1. Introduction

The danger inherent in anchoring the growth prospects of an economy on a single product has long been established. For decades now, Nigeria has remained a mono-product economy, with all her foreign exchange earnings anchored only on oil revenue. Oil export revenue constitutes more than 90% of foreign exchange earnings, and the oil sector persists as the driver of the mono-product Nigerian economy. This sector is the lifeline of the economy and drives policy formulation and implementation, as budgeting is highly dependent on revenue from the sector. This over-dependence on oil is also a significant factor contributing to the non-inclusive nature of the economy and has established the Dutch-disease syndrome in the Nigerian economy. Its dependence on earnings from only one primary export commodity (crude oil), which is susceptible to volatilities in commodity prices, greatly affects the size of its public revenue. Moreover, the growth in Nigeria's crude oil sector does not have positive spillover effects due to poor linkages with other sectors of the economy.

As a result of recent drops in commodity prices, resource-intensive countries have not only experienced a decline in economic growth but have also adopted macroeconomic adjustments to cushion the effects of declining fiscal and export revenues (IMF, 2016). For instance, Economy Watch (2016) reported that Nigeria's real GDP growth, which was 6.3% in 2014, fell drastically to a negative rate of 2.3% in 2016. Its investment and saving rates fell from 15.8% and 16.0% in 2014 to 13.6% and 10.8% in 2016, respectively, and its unemployment rate rose from 7.8% in 2014 to 12.1% in 2016. The poor performance of these macroeconomic indicators proves the dominance of Nigeria's fiscal dependence on oil as a sole driver of policy formulation and implementation. Empirical evidence has shown that the recent decline in Nigeria's fiscal and export revenue base is linked to the 2014 decline in oil prices in the world crude oil market. Hence, Nigeria's declining real GDP growth rate, fiscal revenue, and domestic investment rate, along with its growing unemployment and poverty rates, indicate that macroeconomic adjustments are required to boost output, export in the real sector, and fiscal revenues of the country. Thus, diversifying the economy is important for achieving all-inclusive and sustainable economic growth.

Economic diversification refers to a process by which a growing range of marketable outputs are produced by a country with the aim of fostering economic

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resilience, stability, and security, such that macroeconomic shocks attributed to changes in revenue streams are easily adjusted to. It also involves varying income sources away from domestic economic activities. A diversified economy, which has different revenue sources, provides the ability for sustained economic growth by discouraging reliance on a particular source of revenue. Several pillars of economic diversification open to Nigeria include investment in infrastructure, support for agriculture, providing linkages between producers and markets, improving the business and regulatory environment, and human capital development. Apart from being naturally endowed with resources, Nigeria is blessed with a vigorous, virile, and entrepreneurial human resource pool, including the unutilized potential of women, which is often overlooked due to persistent and prevalent gender inequality.

It is a truism that economic expansion which is not engendered is endangered. Therefore, institutional arrangements and economic policies that encourage greater equality among people and between genders are essential for achieving economic and social development. Gender presents the basic organizing rules of societies, which direct the line of production, distribution, and consumption. Understanding gender dynamics provides an opportunity to appreciate the opportunities, constraints, and impacts of transformation as they affect both men and women (Aina, 2012). Gender equality involves extending equivalent opportunities to both men and women. It is a human right and an essential tool for economic progress and reducing poverty. Although gender equality does not imply any difference between women and men, it implies that both have equal worth and should be accorded equal treatment (International Planned Parenthood Federation, 2017). Nigerian society has been patriarchal even as it evolved from its traditional roots, and this is a major reason for the significant attention placed on societal roles, as gender is a sensitive matter in Nigeria's economic and social progress.

Gender inequality constrains the economic diversification process by reducing the potential pool of human capital, breeding gaps in opportunities such as education and labour force participation, and impeding the development of new ideas. This reduces the effectiveness, efficiency, and efficacy of the nation's labour force by limiting the pool of available talent (as entrepreneurs and employees) (Teignier & Cuberes, 2014). Evidence of gender inequality in Nigeria includes unequal opportunities in permanent employment placements, accessing credit facilities, education, and the prevalence of domestic and workplace violence/sexual harassment against women. This paper seeks to ascertain the extent to which economic diversification responds to gender inequality in Nigeria and to provide policy recommendations aimed at expanding Nigeria's vision toward economic diversification. This goal is pertinent given the literature on the direct and indirect positive and multiplier effects of gender equality and women's empowerment on economic growth, as well as the costs of gender discrimination.

To this end, this paper is structured as follows: Section One introduces the study, Section Two reviews basic literature, Section Three covers research methods and procedures, Section Four presents and discusses results, and Section Five concludes the study with policy recommendations.

2. Literature Review

2.1. Review Of Basic Theories

Notable economists like Kuznets, Grossman, and Helpman have posited that one hallmark of economic growth is the ability to produce and supply a diverse variety, quality, and quantity of goods and services over a long period. Economic diversification is crucial because it reduces the vulnerability and volatilities that economies face, which in turn increases economic growth, as low volatility is associated with higher output. Theories of economic diversification are scarce in economic literature, but the Graham Paradox, Prebisch-Singer Hypothesis, and the Endogenous Growth Theory explain the need for countries to move away from subsistence/primary production to manufacturing and industrialization, which further attract division of labour and specialization.

A. Graham Paradox

In line with the assertion that women constitute more than 50% of farmers and raw material processors in Nigeria, as held by Global Entrepreneurship Monitor (2004) cited in Metu, Nwokoye, and Kalu (2015), this study appreciates the contributions of Graham (1923), which highlight the problems associated with specializing in agriculture for a country modeled in accordance with the Ricardian theory. The Graham Paradox incorporates the non-constancy of unit costs (and by extension, non-constancy of productivity) existing between different sectors of the economy into the Ricardian theory. Specifically, productivity in the manufacturing sector rises as unit costs fall with increasing output due to the benefits of economies of scale, while the unit costs of agricultural products increase with production. For a country with a comparative advantage in agriculture, specialization, according to Ricardian theory, decreases both productivity and the country's total output. Raffer (2004) asserts that even global output declines if the increase in global manufacturing output is not sustained.

B. Prebisch-Singer Hypothesis (PSH)

Prebisch (1950) and Singer (1950) formulated the Prebisch-Singer Hypothesis (PSH), which emphasizes that economic growth cannot be based on primary products since world prices for primary tradable commodities relative to manufactured tradable commodities decline over time. Consequently, the ratio of export prices to import prices (the terms of trade) for developing countries, which are mostly heavily reliant on exports of primary commodities, declines as well.

According to Cuddington, Ludema, and Jayasuriya (2002), the decrease in the terms of trade is often explained by strong labor unions in industrialized countries, which cause wages in the manufacturing sector of each business

cycle to rise at a much higher rate than the equilibrium wage rate. This is often unsustainable and results in unsustainable growth in overall output. Monopolies often flourish in the manufacturing sector, preventing technological advancement and resulting in lower prices. As income grows, the demand for, and hence price of, primary commodities reduce, exhibiting less income elasticity. Technical progress in the manufacturing sector (especially one having a raw-material-saving strategy) causes slow-growing demand for primary products.

In general, the Graham Paradox and the PSH provide arguments in support of economic diversification (of output and export commodities) by explaining the disadvantages of specializing in agriculture (and by extension, the crude oil sector, as is the case with Nigeria). These arguments can serve as a rationale and a theoretical justification for embarking on economic diversification.

C. Endogenous Growth Theory

The Endogenous Growth Theory further emphasizes the importance of the type of production in which a country specializes, as the returns to scale depend on the sector (whether primary/extractive - agricultural and mining sectors or secondary - manufacturing sector). Structural models of economic development demonstrate that countries develop their output (export) structure from primary commodities (exports) into manufactured commodities (exports) to achieve sustained economic growth. Based on the assumption of increasing returns to scale for the manufacturing sector and constant returns to scale for the primary sector, it follows that a country's manufacturing output will grow faster (or slower) than that of the rest of the world if it initially has a comparative advantage in the manufacturing (or primary) sector, as hypothesized by the PSH.

2.2. Theoretical Link Between Gender Inequality And Economic Diversification

According to Kazandjian, Kolovich, Kochhar, and Newiak (2016), economic diversification strongly correlates with structural transformations which involve changes in the relative importance of significant components of the economy, such as improved institutional quality and infrastructure, a higher degree of globalization, changes in market structure, shifts in the sectoral composition of economic activity, as well as a reduction in gender inequality. Accordingly, gender equality can enhance economic diversification through two major channels: the human capital channel and the resource allocation channel (Kazandjian et al., 2016).

The human capital channel enunciates that the gender gap in education can reduce the pool of human capital and ultimately slow the speed of technology adoption and innovation. Similarly, gender inequality in labour force participation is likely to reduce the pool of talent and employable entrepreneurs. This, in turn, diminishes a country's ability to create and execute new ideas, a critical ingredient for economic diversification.

Literature theorizes that gender inequality influences the direction of growth and economic growth, which is an important determinant as well as a by-product of economic diversification. Gender inequality in education can affect economic growth by negatively impacting female education, increasing couples' fertility rates (substituting quantity for quality of children), and thereby reducing the inclination for human capital development for the next generation. Growth in female labour participation further has a direct effect on per capita gross domestic product (GDP) because resources, which were previously focused on subsistence production, are redirected towards production for commerce. As Galor and Weil (1996) put it, as capital intensity increases with economic growth, the relative wages of women also rise. This further induces women's desire for more education, thereby decreasing the relative wage gap between women and men for future generations, as well as increasing women's opportunity cost of labour supply and encouraging them to enter the labour market while foregoing child-rearing.

Boserup (1970) asserts that men's privileged access to education excludes women from the labour force during the early stages of development, but as a nation proceeds along the path to development, women begin to gain access to education and employment. Hence, the postulation that there is a U-shaped relationship between female labour force participation and per capita income. Goldin (1990) interprets this U-shaped postulation as a strong income effect at the early stage and an overriding substitution effect at the later stage. Therefore, well-educated female human capital (in the absence of gender inequality) across occupations and industries can increase a country's GDP.

According to Braunstein (2011), the efficiency argument for gender equality articulates that excluding women from education, employment, and other profitable prospects reduces the pool of potential workforce and entrepreneurs, depriving economies of potential productive assets. Gender inequality generally raises fertility, lowers the accumulated stock of human and material capital for the next generation, and restricts the potential for household productivity as well as the potential for economic diversification. The efficiency argument holds that the net effect of gender inequality is lower rates of per capita income growth.

2.3. Empirical Literature Review

Although there are a plethora of studies linking gender inequality with economic growth, empirical literature linking gender inequality with economic diversification is few. Furthermore, fewer of these studies show the negative impacts of gender gaps in education and employment on economic growth, while the empirical evidence on the positive effects of gender inequality on economic growth is plenty. For instance, Busse and Spielmann (2006) explored the international linkage between gender wage inequality and trade flow for 92 developed and developing economies using cross-sectional data. The study found that gender wage inequality was positively

associated with comparative advantages in labor-intensive goods (i.e., countries with larger gender wage gaps had higher exports of these goods) and by extension had a positive effect on economic growth, while gender inequality in labor force activity rates and educational attainment rates were negatively linked with comparative advantage in labor-intensive commodities.

Esteve-Volart (2009) used cross-sectional data for the Indian economy to investigate the effects of gender discrimination in labor markets using an occupational choice model and found that gender discrimination reduced the human capital stock available to the economy and distorted the distribution of entrepreneurial talent across various occupations. Cuberes and Teignier (2012) studied the effects of gender inequality in selected developing and developed economies' labor markets by engaging a model of talent allocation. The study discovered that if all females were excluded from managerial positions, output per worker would decrease by over 10%, and if all females were excluded from the labor force, the loss in income per capita would be almost 40%.

Barro and Lee (2013) studied 146 economies using cross-country data and found a positive correlation between the growth of per capita income and the initial level of female school attainment after controlling for other factors such as initial per capita income and male school attainment. Cuberes and Teignier (2013) used cross-country data for selected countries in the Middle East, North Africa, Europe, and Central Asia to examine the effects of gender inequality in entrepreneurship and labor force participation on aggregate income and productivity using an occupational choice model with heterogeneous agents in entrepreneurial ability. The results of the study show that gender gaps in entrepreneurship negatively affected aggregate productivity, while gender gaps in labor force participation diminished per capita income. The results from the simulation also showed that the exclusion of all women from entrepreneurship would result in a drop in average output per worker by almost 12%, and an exclusion of all women from the labor force would reduce per capita income by almost 40%.

The study further discovered that gender gaps (inequality) and their entailed income losses are quite comparable across income groups but vary across geographical regions, with a total income loss of 27% in the Middle East and North Africa and a 14% loss in Europe and Central Asia. Teignier and Cuberes (2014) examined the quantitative effects of gender gaps in entrepreneurship and labor force participation on aggregate productivity and per capita income using labor market data from the International Labor Organization for 126 countries. The study simulated an occupational choice model with heterogeneous agents in entrepreneurial ability, where agents choose to be workers, self-employed, or employers while assuming that males and females had the same talent distribution. Results from this simulation showed that gender gaps in entrepreneurship and in female workers' pay negatively affected aggregate productivity, while gender gaps in labor force participation reduced income per capita. Specifically, if all females were excluded from entrepreneurship, average output per worker would drop by 12% as the average talent of entrepreneurs would reduce, and if all women were excluded from participating in the labor force, per capita income would reduce by 40%. The study also found differentials in the cross-country analyses as gender gaps and their implied income losses vary across geographical regions; it found a total loss in income of 27% in the Middle East and North Africa and a 10% loss in Europe.

Cuberes and Teignier (2016) examined the quantitative effects of gender gaps on entrepreneurship and workforce participation with the aid of an occupational choice model which accommodated heterogeneous means in entrepreneurial skills. The study discovered that gender gaps in entrepreneurship negatively affect both income and aggregate productivity since they reduce the entrepreneurs' average talent. Particularly, the expected income loss from excluding 5% of women is 2.5%, while the loss is 10% if they are all employers. The results further confirm that gender gaps cause an average income loss of 15% in the OECD, 40% of which is due to entrepreneurship gaps. When the model was extended to developing countries, substantially higher losses with significant variation across regions were observed.

Kazandjian et al. (2016) studied gender equality and economic diversification in selected low-income countries and developing countries for the period 1990 to 2010 using fixed-effect panel data and the instrumental variable generalized method of moments (IV-GMM). The study modeled output/export diversification as a function of gender inequality using the United Nations gender inequality index as well as a low-income and developing country interaction term amongst other structural, institutional, and policy variables. The major findings include that gender inequality is negatively and significantly associated with export diversification as a lower female-to-male enrollment ratio is a barrier to human capital development in an economy. Secondly, gender inequality in the labor market restrains the development of new ways of doing things, thereby decreasing the overall efficiency of the labor force. These findings support the assertion that gender-friendly policies impact positively on output/export diversification.

In line with Agénor and Canuto (2013), Kim, Lee, and Shin (2016) developed a model to test the relationship between gender inequality and the growth of economies. The model, which primarily focused on the determination of women's time allocation among production for commerce, production for subsistence, child-rearing, and child education, used Asian economies' micro-level data and found that improving gender equality contributes significantly to economic growth through the significant reallocation of females' time and further promotes the accumulation of human capital. Through stimulation, the study also found that the absence of gender inequality would boost aggregate income to about 6.6% and 14.5% higher than its benchmark after one and two generations, respectively, and that corresponding per capita income would also increase by 30.6% and 71.1% in the hypothetical

gender-equality economy as fertility and population expectedly decrease as women participate more freely in labor market activities.

Cavalcanti and Tavares (2016), with a model of endogenous savings, fertility, and labor market participation, studied the output cost of gender discrimination in selected developing and developed countries, including the United States of America, and reported that a rise of 50% in the gender wage gap could lead to a reduction in per capita income by 35% in the steady state for the US economy. It further found that for several countries, a large fraction of the difference between the country's output and the US output can be ascribed to differences in gender discrimination.

In summary, the extensive review of previous studies on the effect of gender inequality on economic diversification has revealed the paucity of this research in Nigerian economic literature, as most studies conducted for developing economies were cross-sectional in nature and therefore did not attend to the country-specifics of the Nigerian economy. This study, therefore, stands in to fill this gap in the literature and to make both theoretical and empirical contributions to the debate on gender inequality and economic diversification.

3. Research Methodology

3.1. Theoretical Framework And Empirical Model

The endogenous growth theory forms the theoretical framework for this study because it emphasizes the importance of the type of production in which a country specializes, as the returns to scale as well as the extent of economic diversification depend on the sector (whether primary/extractive - agricultural and mining sectors or secondary – manufacturing sector) that produces both the exportable goods and the output which yields its bulk of fiscal revenue. Structural models of economic development demonstrate that countries develop their output (export) structure from primary commodities (exports) into manufactured commodities (exports) in order to achieve sustained economic growth. Based on the assumption of increasing returns to scale for the manufacturing sector and constant returns to scale for the primary sector, it apparently follows that a country's manufacturing output will grow faster (or slower) than that of the rest of the world if it had an initial comparative advantage in the manufacturing (or primary) sector as hypothesized by the Prebisch-Singer Hypothesis.

The endogenous growth model explains that economic progress can be achieved within the system governing the production process instead of by forces operating outside the system, as presented by the Solow residual in the neoclassical growth model. They bear some structural resemblance to their neoclassical equivalents, but their most significant structure is in the neglect of the neoclassical assumption of diminishing marginal returns to capital. Most of the endogenous growth models introduce some types of capital like human capital, knowledge, and fertility, whose accumulation is not subject to the assumption of diminishing marginal returns. An endogenous growth model of this type *AK* assumes an economy with a production function which has a constant marginal product of capital, with capital as the only factor input.

Specifically,

$$Y = aK \quad (1)$$

where the output (Y) is proportional to the capital stock (K); the marginal product of capital is simply the constant (a). Furthermore, the endogenous growth theory hinges on the notion that there are substantial external returns to capital especially human capital as each new idea (knowledge) makes the next idea possible hence knowledge can grow indefinitely. The new growth theorists believe that research/development and investment in human capital are the keys to economic progress hence Equation 1 may be further expressed as

$$Y = AK^\alpha L^{1-\alpha} \quad (2)$$

where (Y) is economic progress; (A) is any factor that influences the level of domestic technology, (K) is capital (including material and human aspects) and (L) stands for labour. This model assumes increasing returns to scale and diminishing marginal productivity of factor inputs.

In order to ascertain whether gender inequality is part of the reason for the low economic diversification in Nigeria, this study specified the following general relationship:

$$Y_t = F(X_t) \quad (3)$$

This general form specifies X_t as the vector of determinants of economic diversification in Nigeria. Specifically, the econometric form of the model is as follows:

$$ECOD = \alpha_0 + LPGDP\alpha_1 + OPN\alpha_2 + EXC\alpha_3 + INF\alpha_4 + NAT\alpha_5 + VUL\alpha_6 + LAP\alpha_7 + EMP\alpha_8 + \mu \quad (4)$$

Equation 4 specifies that economic diversification is a function of per capita income, openness of the economy to trade, official exchange rate, infrastructure available in the country, resource endowment and the variables of focus, gender inequality represented by ratios of vulnerability, labour participation and employer. Data for the study spanned from 1990 to 2016. The choice of the scope of the study is based on data availability. All data for the study were sourced from the World Development Indicator (2016).

3.2. Definition Of Variables

Income (LPGDP): This captures the economic size of the country. Economic diversification requires financial strength, and a resource-rich country like Nigeria has an appreciable amount. However, a resource-dependent country like Nigeria often finds it difficult to diversify, leading to a situation known as the resource curse. The income variable is represented by per capita GDP (PGDP), and the a priori expectation is indeterminate. The variable is measured in current United States Dollars.

Openness to Trade (OPN): This measures the extent of the importance of international trade and financial inflows into an economy and is measured as trade as a percentage of GDP. The expectation is that the more open a country is, the greater the extent of diversification.

Exchange Rate (EXC): This is the official rate at which the Naira exchanges for one US dollar. For a country that enjoys an inflow of foreign exchange due to exports of natural resources, the Naira is expected to be more expensive relative to other foreign currencies. This reduces Nigeria's competitiveness and further reduces economic diversification. On the other hand, exchange rate depreciation is expected to increase the demand for Nigerian goods and increase diversification. Therefore, the a priori expectation for the exchange rate is indeterminate.

Infrastructure (INF): The ability of a country to produce both for local consumption and for exports is hinged on the extent of capital accumulation, notably the quality of infrastructure. This study captured this using electric power consumption (kWh per capita), which represents the level and state of infrastructure in Nigeria. We anticipate a positive impact on economic diversification.

Resource Endowment (NAT): Natural resources, such as crude oil, have a significant impact on an economy. When these resources are utilized efficiently, the impact is positive; otherwise, it is negative, giving rise to the resource curse phenomenon. We capture resource endowment with natural resources as a percentage of GDP and expect a negative impact on diversification.

Gender Inequality: This is the variable in focus, and there are numerous measures to capture gender inequality. However, due to the unavailability of complete data for the gender inequality index for Nigeria, this study approved the following measures for gender inequality:

- **The ratio of females to males in vulnerable employment (VUL):** This was calculated by dividing the percentage of females in vulnerable employment by the percentage of males in vulnerable employment. Vulnerable employment is the proportion of self-employed without employees (own account workers) and unpaid family workers (contributing family workers) in total employment. This ratio falls between zero and one. A value of one means there is parity in vulnerable employment between females and males. A value less than one means that females in vulnerable employment are lower than males in vulnerable employment, and a value greater than one means that females in vulnerable employment are higher than males in vulnerable employment. We expect that an increase in the ratio of vulnerability would reduce economic diversification.
- **The ratio of female to male labour force participation rate (LAP):** The labour force participation rate is the proportion of the population ages 15 and older that is economically active (the labour force of the country). This is calculated by dividing the female labour force participation rate by that of the males. This ratio falls between zero and one. A value of one means there is parity in labour participation between females and males. A value less than one shows that female labour participation is lower than male labour participation, while a value greater than one shows that female labour participation is higher than that of males. We expect that an increase in the ratio of labour participation will engender economic diversification.
- **The ratio of females to males who are self-employed (EMP):** This captures the ratio of females to males who work on their own account or with few partners/employees or are self-employed. Parity between men and women exists if the value of this ratio is one. A value less than one means that self-employed females are fewer than their male counterparts, while a value greater than one means that self-employed females are greater than their male counterparts. We expect that as the value tends towards unity, economic diversification increases.

A more gender-equal society will allow women to have more access to education, health, economic, and political opportunities. It will also lead to a more diversified economy as more women are empowered in economic activities.

Economic Diversification (ECO): Our calculation of economic diversification was based on the Herfindahl–Hirschman (H) approach. ECO is computed as the sum of the squares of the sectoral shares of the economy's output. Supposing that N sectors share all economic activities, each one with a contribution k_i and sectoral share

$$S_i = \frac{k_i}{\sum_{j=1}^N k_j}$$

Then the DI can be expressed as:

$$DI = \sum_{i=1}^N S_i^2$$

Since ECO computed using the Herfindahl–Hirschman (H) procedure can range from $1/N$ to one, we place a restriction such that it ranges from zero to one:

$$DI^* = \frac{DI - 1/N}{1 - 1/N} \text{ for } N > 1.$$

H^* ranges from 0 to 1.

According to Tauer (1992) cited in Dimnwobi et al (2017), a DI^* of 0.00 and 0.01, higher than 0.01 but below 0.15, between 0.15 to 0.25 and above 0.25 indicate a highly diversified economy, a bit diversified economy, reasonably diversified economy and an undiversified economy respectively.

4. Result Analysis And Discussion Of Major Findings

4.1 Tests And Results

Data analysis for this study was performed using E-Views 9.0 econometric software. We began by conducting Augmented Dickey-Fuller (ADF) unit root tests for all the variables of the study to check the stationarity or otherwise of these variables. The outcome as presented in Table 1 shows that Since all the variables were found to be stationary at the first difference, we conducted a cointegration test using the Engle-Granger cointegration method to test the long-run relationship among these variables. The result is presented in Table 2.

Table 1: Augmented Dickey-Fuller Test

Variable	ADF Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value	Remarks
ECOD	-6.264405	-4.374307	-3.603302	-3.238054	I(1)
INF	-6.043117	-4.374307	-3.603302	-3.238054	I(1)
EXC	-3.318182	-4.374307	-3.603302	-3.238054	I(1)
OPN	-7.153023	-3.724070	-2.986225	-2.63604	I(1)
LPGDP	-3.63461	-4.374307	-3.603302	-3.238054	I(1)
NAT	-7.599912	-4.394309	-3.612199	-3.243079	I(1)
LAP	-6.977229	-4.374307	-3.603302	-3.238054	I(1)
VUL	-4.680991	-4.374307	-3.603302	-3.238054	I(1)
EMP	-4.338752	-4.416345	-3.622033	-3.248592	I(1)
ECM	-3.966531	-4.356068	-3.595026	-3.233456	I(0)

Source: Authors' computation using E-Views 9.0

Table 2: Long Run Result

Dependent Variable: ECOD

Method: Least Squares

Date: 06/27/18 Time: 20:52

Sample: 1990 2016

Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF	-0.000783	0.000377	-2.077175	0.0516
EXC	0.000173	0.000149	1.157314	0.2615
OPN	0.000714	0.000441	1.616387	0.1225
LPGDP	0.090888	0.083139	1.093205	0.2880
NAT	0.001782	0.000628	2.838506	0.0105
LAP	-0.595274	0.468329	-1.271060	0.2190
VUL	0.263333	0.962798	0.273508	0.7874
EMP	-0.117404	0.282083	-0.416204	0.6819
R-squared	0.802261	Mean dependent var		0.930282
Adjusted R-squared	0.729410	S.D. dependent var		0.038533
S.E. of regression	0.020044	Akaike info criterion		-4.740560

Sum squared resid	0.007634	Schwarz criterion	-4.356608
Log likelihood	71.99756	Hannan-Quinn criter.	-4.626391
Durbin-Watson stat	1.475346		

Source: Authors' computation using E-Views 9.0

The long-run regression results show that the coefficient of determination R^2 is 0.802261 while the adjusted R^2 is 0.729410. This means that the independent variables on average accounted for about 73% of changes in economic diversification and therefore, we can confidently say that the estimated model has a strong goodness of fit. The residual of the results of the long-run equation was generated. This residual, which is the error correction term was found to have unit root at level form (see Table 1). This showed that these variables are cointegrated and that a long-run relationship truly existed among them. We proceeded to run an error correction model with the lagged variable of the error term and the first differenced form of the other variables, and this enabled us to get the short-run relationship which is shown in Table 3.

Table 3: Error Correction Model Result

Dependent Variable: D(ECOD)

Method: Least Squares

Date: 06/27/18 Time: 21:05

Sample (adjusted): 1991 2016

Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF)	-0.000923	0.000425	-2.171101	0.0444
D(EXC)	0.000294	0.000189	1.558946	0.1374
D(OPN)	0.000533	0.000396	1.343383	0.1968
D(LPGDP)	0.172668	0.083076	2.078429	0.0531
D(NAT)	0.001679	0.000494	3.402354	0.0034
D(LAP)	-0.582018	0.435901	-1.335206	0.1994
D(VUL)	-0.562374	0.953481	-0.589812	0.5631
D(EMP)	0.171919	0.320943	0.535668	0.5991
ECM(-1)	-0.728584	0.301199	-2.418948	0.0271
R-squared	0.664933	Mean dependent var		-0.003194
Adjusted R-squared	0.507255	S.D. dependent var		0.026426
S.E. of regression	0.018550	Akaike info criterion		-4.869270
Sum squared resid	0.005850	Schwarz criterion		-4.433775
Log likelihood	72.30050	Hannan-Quinn criter.		-4.743863
Durbin-Watson stat	2.088087			

Source: Authors' computation using E-Views 9.0

The error correction term is negatively signed and significant. The result shows that the speed of adjustment to any distortion in the economy is about 73%. The Durbin-Watson statistic shows the absence of autocorrelation.

4.2 Discussion Of Major Findings

The signs and significance levels of the coefficients of the variables varied according to the time periods. While the coefficients of infrastructure, exchange rate, openness, income, resource endowment, and labor participation maintained their respective signs in the two time periods, the signs for the coefficients of ratios of vulnerable employment and self-employment changed. In the long run, vulnerable employment was positive and negative in the long run and short run, respectively. On the other hand, the coefficients of the ratio of self-employment were negative and positive in the long run and short run, respectively. The significance level of income per capita was insignificant in the long run but significant in the short run. The discussions for each variable are as follows:

Coefficient of the ratio of female to male in vulnerable employment (VUL): Although the short run result is contradictory, the coefficient of the ratio of female to male vulnerable employment is positive but not significant in the long run. This means that as the ratio increases, the number of females in vulnerable employment is higher than males in vulnerable employment, and this increases the diversification index. In other words, as the number of females in vulnerable employment increases, economic diversification increases. We had expected that an increase in the ratio of vulnerability would reduce economic diversification.

Ratio of female to male labor force participation rate (LAP): Our long run result found a negative coefficient for this variable. This means that as the ratio of female to male labor force participation rate increases (that is, increased female labor participation), the economic diversification index reduces. This is obtainable for the two time periods and shows that participation of women in Nigeria's labor market improves our stance on economic diversification.

Ratio of female to male self-employment (EMP): Our findings show a negative coefficient for the ratio of female self-employment. This follows that as female self-employment increases, the economic diversification index decreases in the long run. However, we found that in the short run, an increase in the number of female employers increases economic diversification in Nigeria.

Infrastructure: The sign of the coefficient of infrastructure in the time periods was negative and significant. This means that improvement in infrastructure reduces the diversification index. Thus, an improved infrastructural base increases the level of economic diversification, and this result did not contradict our a priori expectation.

Exchange Rate: Our finding revealed that an increase in the exchange rate (depreciation) increases the diversification index. That is, when the naira/dollar exchange rate depreciates, the diversification index increases, signifying a reduction in economic diversification. Nigeria enjoys a large inflow of petro-dollars, thereby causing appreciation of the currency. In addition, because we do not have adequate goods that are of export quality, the nation most often does not take advantage of the depreciation of the currency.

Openness to Trade: The study found that as the extent of openness to trade increases, the diversification index also increases, signifying a reduction in the level of economic diversification. Thus, openness and increased international trade do not aid Nigeria's diversification drive. Our domestically produced commodities may be displaced by imported commodities, which further hampers our chances at economic diversification.

Income: This study found proof that the size of the Nigerian economy impacts negatively on its economic diversification drive since the sign of the coefficient of income was positive. This means that increases in income positively impact importation, signifying a reduction in the diversification process. This supports the resource-curse syndrome currently plaguing the Nigerian economy.

Resource Endowment: Another proof of Nigeria's resource-curse syndrome is evidenced in the positive coefficient of contributions of the natural resources variable. This means that as the contributions of natural resources to Nigeria's GDP increase, the diversification index increases, signifying lowered potentials for economic diversification.

5. Conclusion and Recommendations

Our study found that the quality of infrastructure is very important for economic diversification because its impact was significant in both the long run and short run. The study also found the existence of a resource curse - the obvious neglect of the non-oil sector and the concentration of attention on the oil sector is the major cause of the insignificant speed in Nigeria's diversification process. This study found that the existing gender inequality has a negative effect on the drive to diversify the economy by reducing the potential pool of human capital and promoting gaps in opportunities. Thus, for opportunities for economic diversification to increase in Nigeria, more programs on female self-employment, an increased ratio of female to male labor force participation rate, and a reduction in the ratio of female to male in vulnerable employment should be included in policy formulations. The results corroborate earlier findings by Cuberes and Teignierz (2013, 2015) and Kazandjian et al. (2016), whose separate studies found that gender gaps in favor of men negatively affect national income, export, and aggregate productivity.

Gender inequality in access to productive resources reduces the use of such resources and thereby creates unemployment. More importantly, unequal access to education, health, and technology makes women less equipped to take on different roles in the production process. Gender inequality is a cause and consequence of persistent poverty in Nigeria, and poverty has been identified as a constraint to economic growth. The existence of these gaps lowers the level and speed of economic diversification. Thus, the imperative of harnessing the unutilized capability of women, hidden and shrouded by persistent and endemic gender inequality, is now. The drop in oil prices since 2014 that triggered the diminishing growth prospects of leading macroeconomic variables and imposed significant macroeconomic adjustment needs on the Nigerian economy calls for the employment of all underutilized resources, including the female gender. Genuine efforts to diversify the economy must involve the vigorous and virile human resource capability of women.

A good number of studies have shown that the female gender suffers from many inequalities. These inequalities come in various forms, including inequality in access to health, education, economic resources, and job opportunities. It also includes gender wage gaps and lack of control over self and productive resources. The consequences of this are many and dire. They affect the individual, her family, her immediate community, and the Nigerian economy at large. These findings confirm Jayasinghe and Nobel (nd), who found that higher levels of gender equality are associated with greater export diversity and quality – a difference of up to 72% on average for export diversity and 42% on average for export quality. Various channels exist through which increased participation of women in economic activities can help widen the economic base of a country. For instance, gender equality ensures that women's disproportionate unpaid work is recognized, reduced, and redistributed so that they

are now more and better capable of contributing to economic growth and diversification. In addition, gender equality ensures that decent jobs are created for all, irrespective of gender, creating a better work environment that will increase productivity.

Creating a balance between men and women is also important for building human capital for the future and thereby sustaining economic diversification. Empirical evidence has shown that an empowered woman is better able to raise more educated and healthier children. The paper, therefore, recommends that efforts should be sustained to totally remove or reduce to their barest minimum all patriarchal tendencies that exploit the female gender and place them at unequal gender relations in Nigeria. It is also recommended that social institutions such as social protection mechanisms should be entrenched further as an avenue to reduce the vulnerabilities faced by women in Nigeria. In addition, deliberate government policy aimed at increasing the provision of infrastructure and upgrading existing ones targeted especially towards the advancement and expansion of sectoral choices is imperative. In this regard, various tiers of government – local, state, and federal – should take advantage and develop other sectors of the economy, especially where their comparative advantage is higher. There is an urgent need to invest heavily in power and ensure the uninterrupted supply of electricity.

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References

- Aina, O. I. (2012). Two halves make a whole: Gender at the crossroads of the Nigerian development agenda. Retrieved from <http://localhost:8080/xmlui/handle/123456789/3583>
- Agénor, P. R., & Canuto, O. (2015). Gender equality and economic growth in Brazil: A long-run analysis. *Journal of Macroeconomics*, 43, 155-172. <https://doi.org/10.1016/j.jmacro.2014.10.004>
- Barro, R. J., & Lee, J. W. (2013). A new data set of educational attainment in the world, 1950-2010. *Journal of Development Economics*, 104, 184-198. <https://doi.org/10.1016/j.jdeveco.2012.10.001>
- Bösrup, E. (1970). Women's Role in Economic Development. Nueva York, St.
- Braunstein, E. (2011). Gender equality and economic growth. *Fe Dergi*, 3, 54-67. https://doi.org/10.1501/Fe0001_00000000055
- Busse, M., & Spielmann, C. (2006). Gender inequality and trade. *Review of International Economics*, 14(3), 362-379. <https://doi.org/10.1111/j.1467-9396.2006.00589.x>
- Cavalcanti, T., & Tavares, J. (2016). The output cost of gender discrimination: A model-based macroeconomics estimate. *The Economic Journal*, 126(590), 109-134. <https://doi.org/10.1111/econj.12303>
- Cuberes, D., & Teignier, M. (2012). Gender gaps in the labor market and aggregate productivity. Working paper. Department of Economics, University of Sheffield. ISSN 1749-8368
- Cuberes, D., & Teignier, M. (2013). Gender gaps in the labor market and aggregate productivity. Unpublished manuscript. Department of Economics, University of Sheffield, United Kingdom.
- Cuberes, D., & Teignier, M. (2016). Aggregate effects of gender gaps in the labor market: A quantitative estimate. *Journal of Human Capital*, 10(1), 1-32. <https://doi.org/10.1086/683847>
- Cuddington, J. T., Ludema, R., & Jayasuriya, S. A. (2002). Prebisch-Singer redux (No. 1506-2016-130803).
- Dimnwobi, S. K., Nwokoye, E. S., Ekesiobi, C. S., & Igbunugo, C. I. (2017). Transportation infrastructure and diversification of Nigeria's economy: Implications for the developmental state. *Nigerian Journal of Economics and Social Studies*, 57(3), 309-331.
- Economy Watch (2010-2016). Retrieved from <http://www.economywatch.com/economic-statistics/Nigeria/GDP-Current-Prices-National-Currency/>. Accessed on 13/08/2018.
- Esteve-Volart, B. (2004). Gender discrimination and growth: Theory and evidence from India. Vol. 42, 1-68.
- Galor, O., & Weil, D. N. (1996). The gender gap, fertility and growth. *American Economic Review*, 85(3), 374-387.
- Goldin, C. (1992). Understanding the gender gap: An economic history of American women. OUP Catalogue.
- International Monetary Fund. (2016). Time for a policy reset. *Regional Economic Outlook: Sub-Saharan Africa*. Washington, DC.
- International Planned Parenthood Federation. (2017). Gender equality strategy and implementation plan. Retrieved from www.ippf.org/resources/ippf-2017-gender-equality. Accessed 1st July. 2018.
- Kazandjian, R., Kolovich, L., Kochhar, K., & Newiak, M. (2019). Gender equality and economic diversification. *Social Sciences*, 8(4), 118. <https://doi.org/10.3390/socsci8040118>

- Kim, J., Lee, J. W., & Shin, K. (2016). A model of gender inequality and economic growth. *Asian Development Bank Economics Working Paper Series* (475). <https://doi.org/10.2139/ssrn.2737844>
- Metu, A., & Nwokoye, E. (2015). Investigating impediments to accessing finance for female micro entrepreneurs in Awka, Nigeria. *International Journal of Banking, Finance, Management & Development Studies*, 1(15), 257-274.
- Prebisch, R., & Unies, N. (1950). The economic development of Latin America and its principal problems. NY.
- Raffer, K., & Singer, H. W. (2002). The economic North-South divide: Six decades of unequal development. Edward Elgar Publishing. <https://doi.org/10.4337/9781843761457>
- Singer, H. W. (1975). The distribution of gains between investing and borrowing countries. In *The Strategy of International Development* (pp. 43-57). Palgrave Macmillan, London. https://doi.org/10.1007/978-1-349-04228-9_3
- Teignier, M., & Cuberes, D. (2014). Aggregate costs of gender gaps in the labor market: A quantitative estimate. <https://doi.org/10.2139/ssrn.2405006>