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Economic Inequality and African Americans: A Comparative Analysis

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Abstract

Fairness or economic justice is one of the key ingredients for the viability and sustainability of any economy. In line with this thought, this paper examines economic inequality between African Americans (Blacks) and White-Americans or the majority population (Whites) in the United States of America from two perspectives: income inequality and wealth disparity from 1980 to 2017. Utilizing the source decomposition of the gini coefficient index, an econometric analysis was conducted to estimate the relationships between the variables using the Ordinary Least Squares technique; to verify the stationarity of the time series data via the Augmented Dickey Fuller unit root test; to confirm for the existence of a long run relationship between inequality coefficient (gini) and the endogenous variables namely income, consumption, and wealth via the Johansen cointegration test; and finally to check for causal relationships between the gini index and the aforementioned endogenous variables using the Granger causality test. The results confirm the existence of a long run relationship between the gini inequality coefficient and the endogenous variables. In addition, the trend analysis in general shows that despite the rise in inequality, the gap between the income of African Americans and Whites is somewhat constant; nevertheless, the wealth disparity between the two racial groups has grown during the stated period. Thus, policy prescriptions are based on these findings.

Keywords: gini, income, inequality, wealth, African-Americans, Whites.

JEL Classification Codes: D63, E01, E21, I24, J15

1. Introduction

Equitable distribution of resources is essential for any viable economy to enhance fairness or economic justice which is critical in maintaining socioeconomic stability. As such, economic inequality in the United States of America has been a subject of discussion for several years, especially for academics in search of policy prescriptions to close the gap. One of the main reasons is the widening inequality gap between Blacks and Whites as some studies have indicated, despite the war on poverty and the Great Society programs as well as the affirmative action law. Specifically, this study examines the economic inequality in the United States between African Americans and European Americans ("Black-White" inequality) from two perspectives: income inequality and wealth disparity from 1980 to 2017. The income inequality perspective utilizes the

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Gini Index to measure inequality between the two racial groups, while wealth disparity perspective utilizes trend analysis to analyze the black-white differences in wealth accumulation. The rest of the study is presented respectively as follows: a brief literature review of economic inequality in the United States with respect to African Americans, theory and model specifications, methodology and data, comparative analysis of the results, conclusion and policy recommendations.

2. Brief Literature Review

A plethora of articles have been written on economic inequalities and how to assess them. Specifically, our focus would not only include inequality, but also sources of inequality. A comprehensive review of economic inequality by Wesley and Peterson (2017) highlights the arguments surrounding the issue – whether economic inequality is really a problem. Despite the arguments by some that inequality obfuscates the issue of poverty, their study highlights the essence of the study of inequality by reviewing its effects on economic growth and efficiency, politics and democracy, individual behaviors and spillover costs, social cohesion and environmental degradation – and concluded that inequality is an important social ill.

Drawing from the historical antecedents of inequality, stemming from the pessimistic view of private capital accumulation and high inequality according to Karl Marx or the optimistic view of Simon Kuznets that suggested that the balancing forces of growth, competition, and technological progress inevitably reduce inequality – Piketty and Saez (2014), presented some basic facts underlying the long-run evolution of income and wealth inequality in Europe and the United States (US). They concluded that income-wealth inequality was very high a century ago, especially in Europe, but declined considerably in the first half of the twentieth century. On the other hand, they observed that income inequality has increased significantly in the US since the 1970s – such that income is distributed unequally in the US relative to Europe.

Kuznets (1955) first initiated the assessment of income inequality by investigating the relationship between economic growth and inequality and finalized that inequality follows a pattern as noted in Piketty and Saez – first rising as average incomes increase together with economic growth and then reaching a maximum and starts to decline as average incomes continue to increase. Kuznet's trailblazing work on income inequality methodology and assessment subsequently motivated other empirical works that provided more insight on income inequality methodologies with respect to income and sources of income. Azam (2016) asserted that such empirical studies assisted policymakers to identify the nature and characteristics of income inequality in a society and formulate policies to solve the attendant problems arising from inequities. Moreover, Azam and Shariff (2011) posited some of the reasons justifying the decomposition studies in line with Lerman and Yitzhaki (1985) – not only to identify what impact does a marginal increase in a specific income source has on inequality, but also to learn how changes in a specific income source affect total inequality.

Furthermore, deriving and applying a Gini coefficient decomposition method to the 1980 US distribution of income, Lerman and Yitzhaki (1985) provided estimates of impacts of alternative income sources on US income inequality – their findings included that spouse's earnings had a larger marginal impact on inequality than did property income. Also, in furtherance of their study on distributional effects of marginal changes in income sources – including taxes and transfers – Lerman and Yitzhaki (1994), utilizing the Gini coefficient decomposition by source

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and the derivation of marginal effects with extended Gini produced estimates of the inequality impact per one dollar change in various US taxes and transfers.

Specifically, there are numerous studies conducted on economic inequality among racial groups in the US mostly along the lines of income and consumption expenditures. For example, Chiteji and Hamilton (2002) examined family connections and the Black-White wealth gap among middle-class families. Their findings suggest that the ability to accumulate wealth depends on poverty and saving behavior. Essentially, they concluded that having parents or siblings or both that are poor explains the gap between wealth accumulation between black and white families. In addition, they asserted that altruistic saving behavior affect wealth accumulation among blacks relative to whites; especially with respect to the influence extended families have on wealth accumulation in the black communities.

Moreover, in a report published by the CFED and the Institute for Policy Studies (2016) on inequality, they examined the growing wealth divide for Black and Latino households and the ways that accelerating concentrations of wealth at the top compound and exacerbate this divide. Their findings indicate that the average wealth of white families from 1983 to 2013 has grown by 84% – 1.2 times rate of growth for the Latino population and three times the rate of growth for the Black population. Thus, they concluded that if the average Black family wealth continues to grow at the same pace as the above period, it would take Black families more than 200 years to amass the same amount of wealth as White families.

3. Theory and Model Specifications

The entry point herein is the source decomposition of the Gini coefficient in accordance with Lerman and Yitzhaki (1985) complemented by a private sector model based on the national income accounting identity of the Gross Domestic Product (GDP); where output is equivalent to income – which is composed of consumption and investment. Thus, this simple model is identified as follows:

$$G = \sum_{k=1}^{k} Y\mathrm{kCkWk} \qquad (1)$$

Where the Gini coefficient is represented by G, and k represents a typical income source which is decomposed as the product of three terms: the income source (Y), the consumption source (C), and the investment source represented as a function of wealth (W). The Lerman-Yitzhaki (LY) approach offers the advantage of examining additional changes in the size of an income source on overall inequality, other factors remaining constant.

Assuming the effect of a marginal change in an income component on overall inequality, whereby a small change in income from source k equal to eYk, where e is close to 1 and Yk represents income from source k. Therefore, the effect of a marginal change in any source (say, income or consumption or wealth) on the Gini coefficient is derived from the partial derivative of the Gini coefficient with respect to a percent change (e) in source k as:

$$\frac{\partial G}{\partial ek} = \mathrm{Yk}(\mathrm{WkCk} - \mathrm{Y}) \qquad (2)$$

Where G is the Gini coefficient of overall economic inequality. As such, dividing equation (2) by G provides the source's marginal effect relative to the overall Gini, which can be interpreted

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as the source's inequality contribution as a percentage of the overall Gini less the source's share of total income (economic) inequality:

$$\frac{\partial G/\partial ek}{G} = \frac{Yk\,WkCk}{G} - Yk \quad (3)$$

Where the sum of the relative marginal effects is equivalent to zero. Thus, multiplying all sources by e does not change the overall Gini coefficient.

4. Methodology and Data

We partially adopt the LY (Lerman-Yitzhaki) model by postulating the following Gini decomposition: the median income of households (Y), the consumer price index as a proxy for consumption (C), and the mean earnings of workers 18 years of age and over by educational attainment as a proxy for investment – via investment in human capital. Therefore, the mean earnings of educational attainment (MEED) is considered a proxy for wealth (W) – since the number of years attained in education has been demonstrated by various studies to positively correlate with income and better opportunities for wealth accumulation. For example, Wolla and Sullivan (2017) illustrated that those with more education earn higher incomes and have greater opportunities for wealth accumulation as captured by their "college premium" concept and research by Valletta (2015). They postulate that the more skills people have, the more employable they are and the lower their unemployment rate relative to those with less education or skills.

Given the aforementioned assumptions, we postulate a generalized Gini decomposed as a function of median income (Y), consumption (C), and wealth (W). Thus, the econometric equation for the regression model is posited in equation (4) in the form of a loglinear model or the constant elasticity form at time (t), while ε is the residual or error term such that:

$$\ln gt = \beta 1 + \beta 2\ln Yt + \beta 3\ln Ct + \beta 4\ln Wt + \varepsilon t \quad (4)$$

where the elasticity coefficients represented by β2, β3, and β4 capture the marginal effects with respect to income, consumption, and wealth opportunities; respectively. The regression equation (4) is empirically estimated after testing for stationarity of the variables and cointegrating vectors among them. As buttressed by Gujarati and Porter (2009), regression models involving time series data sometimes give results that are spurious – correlation could persist in non-stationary time series even if the sample is very large. In other words, implying that the series might be non-stationary or contain unit root – a persistent time series process in which current value is the same as lagging value, in addition to a weakly dependent disturbance (Woolridge, 2006). The Augmented Dickey Fuller (ADF) test is employed to test for the existence of unit root. According to Greene (2003), the ADF test for unit root is formulated as:

$$Wt = \mu + \eta Wt\text{-}1 + \sum_{i=1}^{n} \gamma j \Delta Wt\text{-}I + \mu t \quad (5)$$

Where the ADF unit root test hypothesizes a null of η = 0 versus an alternative η < 0. Thus, if the series contain unit root, then cointegration is necessary.

Employing the cointegration methods of Johansen and Juselius (1990) given a Vector Autoregression (VAR) model such as:

$$\Delta Xt = \Sigma\Gamma i \Delta Xt\text{-}I + \Omega Xt\text{-}I + \mu + Et \quad (6)$$

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Where Xt is the vector of non-stationary variables; p x 1 and i = 1, ……., k.

As such, the Johansen and Juselius procedure verifies if the coefficient matrix Ω captures the fundamentals of long run equilibrium consistent with the model.

The data for the variables were based on time series from 1980 to 2017 and obtained from the U.S. Census Bureau website.

5. Results and Analysis

The estimations of the hypotheses tested based on the regression equation (4) utilized the Ordinary Least Squares (OLS) techniques, among others. Generally, hypothesis testing is concerned with developing standard procedures for accepting or rejecting the null hypothesis in favor of the alternative hypothesis. The assumption is that the estimated variable has a probability distribution that is normal with mean of zero and a unit variance (Gujarati, 1999). Table 1 shows the results of the OLS regression estimates.

Table 1: Results of the Ordinary Least Squares Regression

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C	-0.694601	1.000361	-0.694351	0.4922
LNINCOME	-0.188383	0.134000	-1.405849	0.1688
LNCPI	-0.184264	0.162293	-1.135377	0.2642
LNMEED	0.280340	0.133721	2.096455	0.0436
R-squared	0.915087	Mean dependent var		-0.799594
Adjusted R-squared	0.907595	S.D. dependent var		0.053484
S.E. of regression	0.016258	Akaike info criterion		-5.301132
Sum squared resid	0.008987	Schwarz criterion		-5.128754
Log likelihood	104.7215	Hannan-Quinn criter.		-5.239801
F-statistic	122.1373	Durbin-Watson stat		0.762545
Prob(F-statistic)	0.000000			

Although the R^2 of 0.915 suggests a high overall fit of the regression given the data; however, the low Durbin-Watson statistic of 0.762 indicates spurious activities in the stochastic variable or autocorrelation. Hence, the error term exhibits autocorrelation and the time series data might be serially correlated – implying non-stationarity of the variables or random walk. As such, we tested for the stationarity of the variables using the ADF test as shown in Table 2 below.

Table 2: Results of the Augmented Dickey Fuller (ADF) Tests for Unit Roots

Variables	*Level*		*First Difference*	
	t-Statistic	**p value*	*t-Statistic*	**p value*
Lngini	-2.17	0.22	-3.67	0.00
Lnincome	-2.01	0.28	-4.21	0.00
Lncpi	-5.80	0.00	-5.43	0.00
Lnmeed	-3.93	0.00	3.20	0.02

*Mackinnon (1996) one-sided p values

Except for the consumption (cpi) and the wealth variables (meed), the results of the ADF tests show that the gini and income variables are non-stationary at level and thus we cannot reject the null hypothesis of the presence of unit root or non-stationarity in them. However, after applying first difference, stationarity is restored for all variables employed – the series are said to be

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integrated of order one I(1) because taking a first difference produces a stationary process; a nonstationary series is integrated of order d, denoted I(d), if it becomes stationary after being first differenced d times (Greene, 2018).

Table 3: Results of the Johansen Cointegration Tests
Sample (adjusted): 1983-2017
Included observations: 35 after adjustments
Trend assumption: Linear deterministic trend
Series: D(LNGINI) D(LNINCOME) D(LNCPI) D(LNMEED)

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	*Eigenvalue*	*Trace Statistic*	*0.05 Critical Value*	*Prob.***
None *	0.553934	68.42778	47.85613	0.0002
At most 1 *	0.438364	40.17272	29.79707	0.0023
At most 2 *	0.271604	19.98118	15.49471	0.0098
At most 3 *	0.224293	8.889333	3.841466	0.0029

Lags interval (in first differences): 1 to 1
Trace test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	*Eigenvalue*	*Max-Eigen Statistic*	*0.05 Critical Value*	*Prob.***
None *	0.553934	28.25506	27.58434	0.0410
At most 1	0.438364	20.19154	21.13162	0.0673
At most 2	0.271604	11.09184	14.26460	0.1497
At most 3 *	0.224293	8.889333	3.841466	0.0029

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

After ensuring stationarity of the variables, we investigated the presence of long run equilibrium relationship between the gini index and income, consumption, and wealth variables utilizing the Johansen cointegration test as shown above in Table 3. The estimates as captured by the Trace statistics and Maximum Eigenvalue are used for indicating the number of cointegrating vectors. Firstly, the Trace test results show that the null hypotheses for no cointegration, one cointegration, two cointegration, and three cointegration can be rejected in favor of the alternative hypotheses based on the critical value of 0.05 and their corresponding p values, respectively. Secondly, the Maximum Eigenvalue indicates at least one cointegrating vector at the critical value of 0.05 and the corresponding p value. Overall, we could conclude that the gini index indicates a long run equilibrium relationship with income, consumption, and wealth variables.

Since correlation does not necessarily imply causation, we test for causation by applying the Granger causality test on the gini coefficient with respect to each of the dependent variables, namely, income, consumption, and wealth. The results of the Granger causality test in Table 4 suggest the presence of unidirectional causal relationship between the gini inequality index and

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income and wealth, respectively and no causal relationship between gini inequality index and consumption. In other words, income causes inequality, but the gini (inequality) does not affect income; likewise, wealth causes inequality, but the gini does not influence wealth accumulation.

Table 4: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
Sample: 1980- 2017			
Lags: 2			
Null Hypothesis:	***Obs***	***F-Statistic***	*Prob.*
D(INCOME) does not Granger Cause D(GINI)	35	4.43816	0.0205
D(GINI) does not Granger Cause D(INCOME)		1.77148	0.1874
Sample: 1980-2017			
Lags: 2			
Null Hypothesis:	***Obs***	***F-Statistic***	***Prob.***
D(CPI) does not Granger Cause D(GINI)	35	1.13206	0.3358
D(GINI) does not Granger Cause D(CPI)		0.64166	0.5335
Sample: 1980-2017			
Lags: 2			
Null Hypothesis:	***Obs***	***F-Statistic***	***Prob.***
D(MEED) does not Granger Cause D(GINI)	35	7.19942	0.0028
D(GINI) does not Granger Cause D(MEED)		2.63744	0.0881

6. Comparative Analysis

Taking into consideration the aforementioned econometric results, we employ a trend analysis to examine inequality between Blacks (African Americans) and Whites (the majority population). Since the results show causation between income and gini inequality as well as causation between wealth and the gini inequality, we adopt the two dependent variables and investigate their relationships with the gini inequality index with respect to African Americans and Whites during the period of 1980 to 2017.

Undoubtedly, the growth trend of the gini index for measuring inequality has been rising during the period of interest in the United States (U.S.). The lowest value was 0.403 in 1980 and the highest value was 0.482 in 2013 as shown in Figure 1.

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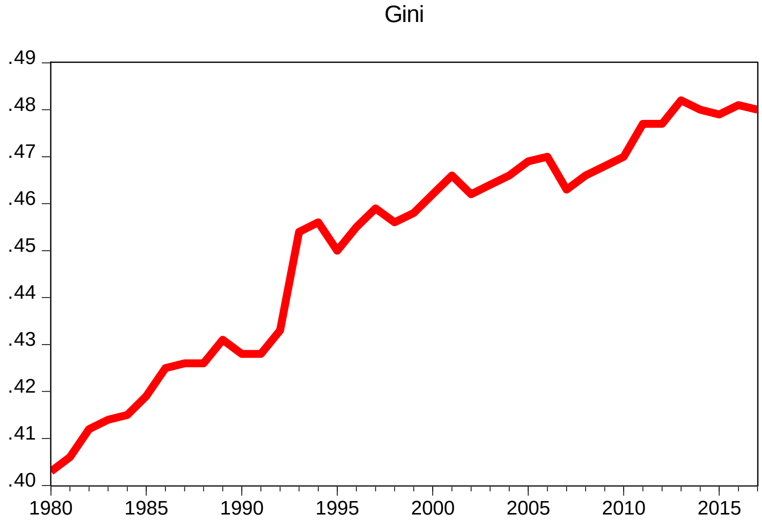
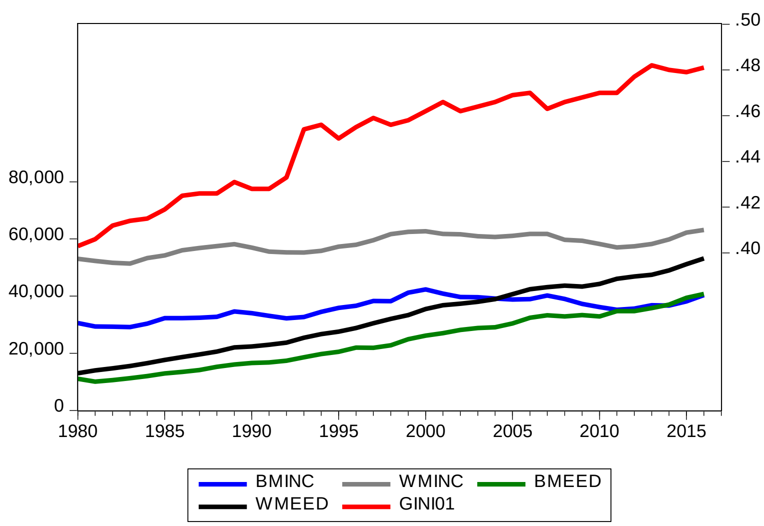


Data Source: U.S. Census Bureau. Income Gini Ratio for Households by Race of Householder, All Races. The Gini index gauges inequality on a scale of 0 to 1; O = No inequality, and 1 = Perfect Inequality.

Figure 1: U.S. Income Inequality

The comparative trend in Figure 2 depicts that as the gini inequality is rising over time, the median income for Blacks (BMINC) and Whites (WMINC) consistently fluctuate slightly; while the gap remains about the same. Furthermore, the mean earnings in education for both Blacks (BMEED) and Whites (WMEED) follow the same rising positive trend, whereas the gap between them seems to be diverging as inequality rises. These observations using median income and mean earnings for education attainment and the gini inequality for Blacks and Whites are further illustrated specifically in Figures 3 and 4, respectively.



Data Source: U.S. Census Bureau. Income Gini Ratio (GINI01) is for Households by Race of Householder, All Races. Median incomes and Mean Earnings for Educational Attainment were compared for Blacks and Whites: BMINC and WMINC; and BMEED and WMEED, respectively.

Figure 2: Comparative Trend between Blacks and Whites

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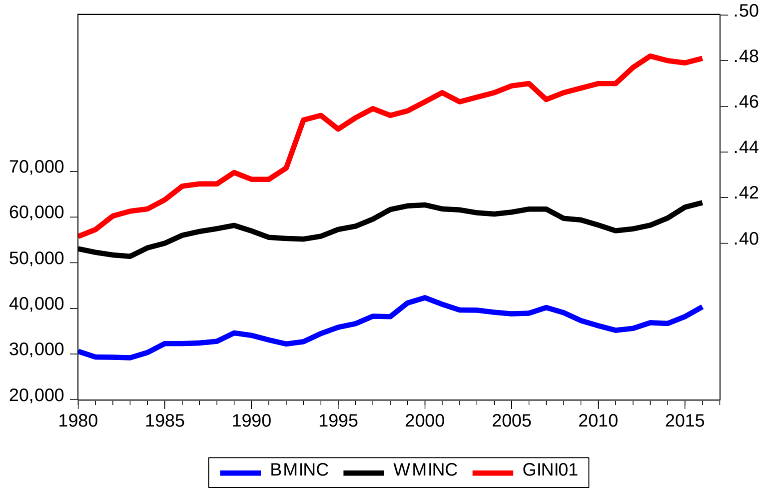
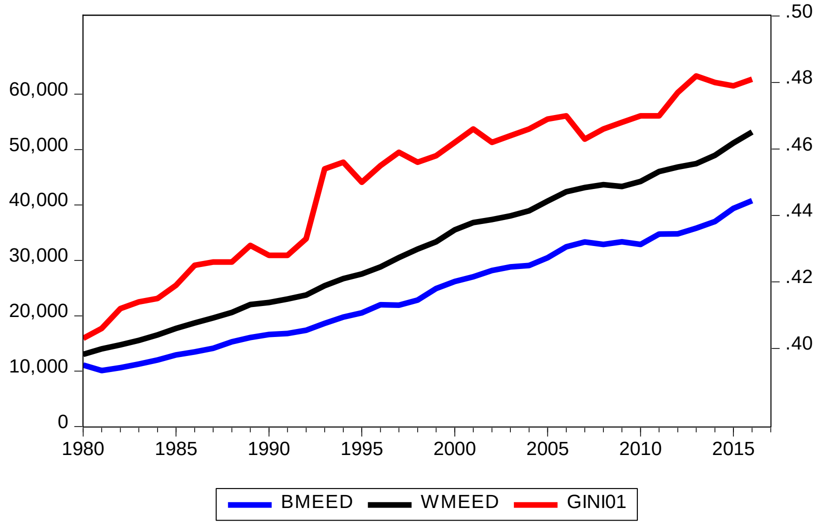


Data Source: U.S. Census Bureau. Income Gini Ratio (GINI01) is for Households by Race of Householder, All Races. Median incomes were compared for Blacks (BMINC) and Whites (WMINC).

Figure 3: Trends between Blacks and Whites Median Incomes



Data Source: U.S. Census Bureau. Income Gini Ratio (GINI01) is for Households by Race of Householder, All Races. Mean Earnings for Education were compared for Blacks (BMEED) and Whites (WMEED).

Figure 4: Trends between Blacks and Whites Mean Earnings for Education

7. Conclusion and Recommendations

This study examines the economic inequality in the United States in general, and specifically with respect to African Americans (Blacks) and the majority population (Whites) from 1980 to 2017 based on time series data. First, an econometric analysis was conducted: to estimate the relationships between the variables using the Ordinary Least Squares (OLS) technique; to ascertain the stationarity of the time series data by utilizing the Augmented Dickey Fuller (ADF) unit root test; to confirm for the existence of a long run relationship between inequality coefficient (gini) and the endogenous variables of income, consumption, and wealth by applying the Johansen cointegration test; and finally to check for causal relationships between the gini inequality index and the posited endogenous variables, we employed the Granger causality test.

The results indicate: an overall fit for the regression with spurious signals of autocorrelation and non-stationarity. After ensuring for stationarity based on the ADF tests and first difference, the cointegration test confirmed the existence of long run relationship between the gini index for inequality and income, consumption, and wealth. Since correlation is not necessarily causation, the causation tests imply that there is a unidirectional causal relationship between the gini index and income as well as gini index and earnings for educational attainment. In essence, income causes inequality and earnings for educational attainment causes inequality; however, the reverse is not the case in both cases.

Second, a trend analysis was employed to compare the effects of economic inequality on African Americans (Blacks) and Whites using the two variables that indicated causation, namely income and wealth. We found that although African Americans and Whites experience the same rising positive trend in terms of inequality and income as well as inequality and earnings for educational attainment or wealth; the gap between the income of African Americans and Whites is at least constant if not widening as inequality trends upwards, while the wealth gap – captured in Figure 4 as the differential between the earnings for educational attainment of African Americans and Whites – is growing as inequality rises.

Generally, the problem of economic inequality needs to be addressed in light of its negative externality effects not only on African Americans, but also among all races. As a result of the findings herein, specifically we prescribe the following recommendations: enhancing knowledge, skills, and abilities of African Americans to improve employment opportunities to reduce income disparities; diversification of savings or investments to reduce risk of financial instability; reduction of debt to asset ratio; while improving financial literacy to encourage wealth building and lower wealth inequality.

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