# Sustainable Development in ECOWAS: A Super Highway Study

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**Abstract:** Over the last four decades, countries in West Africa sub-region have continued to search for an economic integration model through which its socio-economic prosperity will be enhanced. However, despite numerous sub-regional summits, little has been achieved to date in terms of sustainable economic development thus securing an almost permanent seat for the region as one of the world poorest. While regional integration is increasingly being accepted as essential in facilitating socio-economic growth, various accounts from the extant literature indicates that the lack of political will by ECOWAS leaders, among other concomitant factors, have led to the region's inability to drive home the lofty ideas as contained in its numerous protocols. This paper examines the critical factors that have hampered socio-economic growth in the West Africa sub-region and highlights the imperative of an ECOWAS Super Highway as a driving force for the rapid transformation of a region so rich in human and materials resources yet is nested in a web of abject poverty. The study adopts survey method for its data collection. Data were collected by means of self-designed questionnaire designed on a 5-point Likert scale. The SPSS data software was used in the empirical analysis. Three main hypotheses were formulated and tested for this study. Results from this study indicate a strong association between a super Highway and improve economic integration in the ECOWAS sub-region. Our study further reveals that a Super Highway will serve to promote political stability within the ECOWAS sub-region, although not to a significant extent. Our findings also show that the challenge of language will be highly mitigated if an ECOWAS Super Highway is in place as this will aid in bridging the cultural divide that has existed between its Anglo-phone and Franco-Phone member-states. As a policy-driven research, this study has implications for theory and practice. The study makes original contribution to knowledge as the empirical literature is enriched. Furthermore, the study provides a platform that brings the ECOWAS Super Highway conundrum to both regional and International conversations. Finally, the paper provides an opportunity for further research to assist regional policy formulation particularly as it affects cross-border transportation system within the ECOWAS sub-region.

**Key words:** sustainable development; West Africa sub-region; economic integration; ECOWAS; super highway; cross-border transportation system

**JEL codes:** L, R

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## 1. Introduction

West Africa is among the least developed and poorest regions of the world and a majority of its population lives in poverty (Rönnbäck, 2008). The Economic Community of West African States (ECOWAS) sub-region with a combined market of above 300 million inhabitants and a GDP of about $565 billion still has eleven out of its fifteen members listed among the world's poorest and least developed countries (Ogbonna, Aluko, & Awuah, 2013). Empirical evidence show that in most West African countries, its citizens live on an average of less than US$2.00 per day (Anger, 2010). Poverty rates remain high (Ntara, 2016). However, despite the widespread poverty level, the region is of importance for global actors such as China, US and the EU in their need to secure present and future supplies of strategically important natural resources (Rönnbäck, 2008). Over the last four decades, countries in the West Africa sub-region (namely; Nigeria, Benin Republic, Togo, Ghana, Cote 'd Ivoire, Sierra-leone, Liberia, Guinea, Guinea Bisau, Niger, Mali, Burkina Faso, The Gambia, Senegal, and Cape Verde) have continued to search for an economic integration model through which its socio-economic prosperity will be enhanced. With the exception of Nigeria, Ghana and Cote'd Ivoire, the rest twelve are listed amongst the world 50 poorest countries (Sesay & Omotosho, 2011). The search for socio-economic development in West Africa has been at the centre of the emergence of different programmes and initiatives by successive governments in the sub-region (Ntara, 2016). The ECOWAS has demonstrated a measure of effectiveness in matters of security and conflict resolution by the establishment of ECOMOG and only recently, the synergized actions against Boko Haram insurgency in the region (Fayomi & Adeola, 2016). However, despite the imperative for regional integration, bad leadership and governance in the majority of the countries in the sub-region with its attendant lack or poor infrastructure like roads, electricity, bad economy, etc. has created a large number of unemployed youths amongst its various populations (Ajakaiye & Ncube, 2010) which constitute ready and willing tools for restive agitations. The ECOWAS was launched in Lagos on 28th May, 1975 amidst fanfare and big dreams of economic nirvana; economic integration; development and prosperity (Okom, 2016). The ECOWAS is a product of an International treaty between the sovereign States of the West African sub-region. Key protocols and programmes envisioned by the leaders of ECOWAS included instruments such as free movement of persons, right of residence and establishment, trade liberalization, monetary co-operation, transport, telecommunication, energy and power, mechanism for conflict resolution, peace and security and ECOWAS Court of justice (Butu, 2013). However, when the ECOWAS Protocol on free Movement, Residence and Establishment was enacted in 1991, it held great promise for the earlier vision of the founding fathers for a borderless West African region (Udoh, 2015). But ECOWAS, formed some forty years ago to represent some of the most autocratic governments and poorest states in Africa, has not quite lived up to its original ideal of fostering greater economic cooperation among its members (Bamfo, 2013).

### 1.1 Statement of the Problem

Recent scholarly evidence show that African countries are performing poorly regardless of their commitment to regional trade and economic growth (Ntara, 2016). The objective of ECOWAS which is to foster a homogeneous society ultimately leading to the unity of West Africa through the elimination of all obstacles to the free movement of goods, capital and persons (Zagaris, 1978), has remained elusive nearly four decades after the signing of the protocol (Udoh, 2015). As a developing continent, Africa needs to address a lot of concerns with respect to urban transportation and to be at par with other developing nations in the world (Abuhamoud, Rahmat, & Ismail, 2011). Transport systems affects in a great deal the life and development of people and region,

especially in their relationships between the countries within and abroad. But as argued by Agbonkhese and Adekola (2014, p. 370) "the poor infrastructure, transport systems and communication system linking ECOWAS countries are woefully inadequate in all the member state countries and would probably slow the pace of cooperation and integration". While ECOWAS is arguably the African Regional Economic Community with the most ambitious agenda for regional integration and the loftiest stated policy goals backed up by the consensual support of its population and private sector, its cross-border transportation system is inadequate. Several attempts have been made in the past to kick-start the Trans-West African highway network envisaged in 1967, but the more than 4,000 km highway with an estimated cost of $400m intended to link the Senegalese capital Dakar and Nigeria's Lagos has yet to see any meaningful progress (Hirsch, 2013). This paper aims to bring the ECOWAS super Highway conundrum to both regional and International conversations.

### 1.2 Originality of Study

Over the last few decades, several studies have been conducted on the socio-economic development and economic integration in West Africa (Agbonkhese & Adekola, 2014; Udoh, 2015). However, while the focus of the numerous studies has been on governance and leadership, security, political instability and violent conflicts, currency issues, debt burden, GDP, trade and commerce, terrorism and regional integration, there is no studies yet that is specifically targeted at drawing out the salience of an ECOWAS super Highway as captured in this study. Also, Udoh (2015) in his study on regional integration in West Africa opined that the ECOWAS agenda may not be achievable unless and until the construction of a Trans-West African Highway network part of which would run from Lagos to Dakar. An effective super Highway across the region can potentially create the much desired catalyst for socio-economic activities to thrive. Thus, this original empirical based study therefore adds to the body of knowledge and enriches the literature in this critical but often overlooked sector – road infrastructure.

### 1.3 Theoretical Framework

In this study, the neo-functional theory was applied as a guiding theoretical framework. The neo-functional theory is a theory that tries to adopt the use of spill-over as a concept that attempts to indicate that, whenever you want to integrate the first sector, then you have to incorporate the related area so as to enjoy the full benefits of that integration. As ECOWAS leaders continue the search for a workable economic integration model, it is imperative to incorporate an agenda on how to open up the highways to pave way for other integration indices such as trade and commerce, free movement and residence, cultural integration etc. According to Ogbonna et al. (2013), neo-functionalism as a theory and strategy of regional integration, re-introduces the concept of territorialism, though without downplaying its global dimension. For a region like West Africa with its Anglo-Francophone divide, a clearer and potentially sure path to true integration is to first and foremost minimize factors that inhibit free and easy movement of citizens and goods alike. This, if and when a super highway is fully implemented, will energize other key sectors, as propounded by neo-functional theorists, which will in turn promote sustainable development resulting from socio-economic integration.

## 2. Literature Review

### 2.1 Globalization and Regional Integration: An Overview

Regional integration as a process of both deepening and widening relationships amongst actors has seen a growing number of scholars researching on the subject. From a global perspective, contemporary regional integration organizations were formed in the aftermath of the Second World War to prevent the escalation of

conflicts and focus on economic cooperation to improve trade and industry, exchange of knowledge and technology (Fulgence, 2015). Regional integration can be complementary to the process of globalization in both seizing the opportunities presented by globalization, and in guarding against and overcoming the attendant vulnerabilities and challenges (Sesay & Omotosho, 2011). The era of isolated tiny national economies has to give way to strategic alliance that harnesses knowledge and resource based comparative advantages through sub-regional integration (Sampson & Imoh-Ita, 2014). While most regions have significantly benefited from globalization measured by increasing trade openness and FDI, poorer countries like is seen within the ECOWAS has not benefitted much from the positive effect of globalization (Samimi & Jenatabadi, 2014). High and middle-income countries benefit from globalization whereas low-income countries do not gain from it. Despite the possible benefits from the phenomenon, some studies show that globalization has widened the gap between rich and poor countries (Wenjing et al., 2012). Furthermore, a review of regional integration shows that whilst regionalism protects against the worst effects of globalization and unites countries, it also encourages sub-national movements, thus heightening the dangers of national divisiveness (Sideri, 2007).

**2.2 Regional Integration: Why ECOWAS Opted for the Various Protocols and Programmes**

Regional integration is increasingly being accepted as essential in facilitating economic and political development of regions around the world (Chingono & Nakana, 2009). From the perspective of Africa, regional integration is seen as a rational response to the challenges militating against trade and infrastructural deficit amongst countries within regions. A country may reap economic and political benefits from joining an association that involves other countries that share identical characteristics rather than relying solely on its own resources (Bamfo, 2013). As stated by Chingono and Nakana (2009, p. 397) "the major rationale for regional integration is the belief that there is strength in numbers and in unity and that this strength can speed up the pace of development as well as enhance security". According to Fulgence (2015), the African regional integration was mostly formed in the early days of independence to reaffirm their integrity and sovereignty. The objective of ECOWAS, which is to foster a homogeneous society ultimately leading to the unity of West Africa through the elimination of all obstacles to the free movement of goods, capital and persons, offers a new hope for future development and stability within a region traditionally burdened by fragmentation and conflicting interests (Zagaris, 1978). The drive by ECOWAS leaders to promote socio-economic and political development within member-states has seen a growing number of protocols and programmes aimed at ensuring realization of the set goals. For instance, the ECOWAS Protocol relating to the Free Movement of Persons, Residence and Establishment was approved by the ECOWAS heads of state and the government in Dakar on 29 May 1979 (Bolarinwa, 2015). The Community Court of Justice of the ECOWAS is an increasingly active and bold adjudicator of human rights (Butu, 2013). Since acquiring jurisdiction over human Rights complaints in 2005, the ECOWAS Court has issued numerous decisions condemning human rights violations by the member states of the Economic Community of West African States.  In as much as the nearly four decades' union has managed to survive so far, it has only remained a talk-shop with its documents being a compendium of finesse intellectual rhetoric and policy option devoid of political will to set conventions flying and troubled by other socio-cultural elements (Ogbonna et al., 2013). While the protocol on Free Movement of persons has witnessed some measure of successful implementation, others including trade liberalization, monetary co-operation, transport, telecommunication, energy and power, mechanism for conflict prevention, management and resolution, and peace making and security has not seen much progress due to lack of political will by leaders of member States (Butu, 2013). As a corollary to the trade liberalization challenges within the ECOWAS as stated above, studies by Geda

and Kebret (2008) shows that regional groupings had insignificant effect on the flow of bilateral trade. Consequently, the region has remained largely under-developed and lacking in regional growth and co-operation. Some scholars have blamed the state of inertia in the region on conflicts, crisis of confidence, lack of political will and administrative bottlenecks, inability of member states to implement protocols, foreign intervention, language berries and lack of single currency as among the noticeable challenges facing the ECOWAS region (Alao, Olusegun, Ayomola, Eyitayo, & Irewumi, 2012; Butu, 2013). Other Scholars, for example, Chingono and Nakana (2009) points to nationalist rivalry; incompatible political and economic systems; mono-cultural agro-based economies; unjust international economic structures; lack of infrastructure, financial and technical resources; the uneven distribution of the benefits of integration; and rapid population growth as other concomitant factors that have slowed down the desired pace of economic integration in the ECOWAS sub-region. Furthermore, the region is plagued by social-cultural challenges that cuts across different and varying socio-cultural backgrounds with regards to colonialism as well as internally diffused ethnic groupings (Ogbonna et al., 2013).

## 3. Methodology

This study adopts survey method for its data collection. Participants were drawn from Ghana and Nigeria. The two ECOWAS countries were selected for the study for a number of reasons. Firstly, Ghana and Nigeria are the two largest economies in the sub-region (IMF World Economic Outlook, 2016). Secondly, both are English speaking countries which help eliminate interpretation problems usually associated with language barrier for the researcher as most countries in the sub-region are French-speaking. Three main hypotheses were formulated and data collected to confirm or disprove them. Data were collected by means of self-designed questionnaire designed on a 5-point Likert scale. In all 62 questionnaires containing 21 questions each were distributed to Senior Government officials, middle class citizens, transport operators, artisans and other categories. The sample population distribution was carefully selected to cover data sources so as to ensure triangulation. Responses were impressive as a total of 50 responses representing about 80% of the sample population were received. The SPSS data analysis software was used in testing the hypotheses formulated. The data used in the empirical analyses were based on the researcher's findings from the field. In the next section, the results of the data analysis and the accompanying discussion were presented.

## 4. Analysis and Discussion

Three main hypotheses were formulated and data collected to confirm or disprove them.
(1) $H_0$: A Super Highway does not improve economic integration in the ECOWAS sub-region.
(2) $H_1$: A super Highway does improve economic integration in the ECOWAS sub-region.

The first hypothesis is related to questions 2, 9, 11 and 20 and assess the effect of Super Highway on improve economic integration.    The average responses of these four questions were combined into one scaled variable for each respondent. This variable on average will be close to 1 if almost everyone is in agreement with the null hypothesis ($H_0$); and the average value of this will be close to 5 if almost everyone is in disagreement with null hypothesis and supporting the alternative hypothesis ($H_1$). The average value of this variable will be around 3 if on average the respondents are undecided.

### 4.1 First Test

Therefore, we test the first hypothesis by statistically testing if the average of such measure in the population

is 3 or 4 against the alternative that it is greater than 3 or 4.

For tables on first Hypothesis Testing (see appendix 1)

$H_0$: The population mean =3; $H_1$: The population mean > 3

The sample mean value is 4.33; the test statistics t = 16.83, and the null hypothesis of the test is rejected with p-value = 0.000.

$H_0$: The population mean = 4; $H_1$: The population mean > 4

The sample mean value is 4.33; the test statistics t = 4.17, and the null hypothesis of the test is rejected with p-value = 0.000.

Therefore, respondents reject that the population mean of the first hypothesis is on average 4 (agree) in favour of the alternative that is it greater than 4 (better than agree). Hence, evidence that the respondents almost strongly agree that there is association between a Super Highway and improve economic integration in the ECOWAS sub-region.

**4.2 Second Test**

(1) $H_0$: A Super Highway does not promote political stability amongst ECOWAS member States

(2) $H_1$: A Super Highway does promote political stability amongst ECOWAS member States

We test the second hypothesis by statistically testing if the average of second measure in the population is 3 or 4 against the alternative that it is greater than 3 or 4.

$H_0$: The population mean = 3; $H_1$: The population mean > 3

For table of results on Second Hypothesis testing (see appendix 2)

The sample mean value is 3.88; the test statistics t = 8.56, and the null hypothesis of the test is rejected with p-value = 0.000.

Therefore, respondents reject that the population mean of the second hypothesis is on average 3 (Not sure) in favour of the alternative that is it greater than 3 (better than Not sure). Hence, evidence that the respondents agree that there is association between a Super Highway and political stability in the ECOWAS sub-region.

The test is not significant for testing if the mean value is 4 against higher than 4. The null hypothesis cannot be rejected with p_value = 0.88.

Hence, evidence that the respondents agree that there is association between a Super Highway and political stability in the ECOWAS sub-region; but not strongly agree.

**4.3 Third Test**

(1) $H_0$: There is no significant improvement in the socio-cultural affinity of the people due to the presence of a Super Highway across the ECOWAS sub-region.

(2) $H_1$: There is significant improvement in the socio-cultural affinity of the people due to the presence of a Super Highway across the ECOWAS sub-region.

We test the third hypothesis by statistically testing if the average of third measure in the population is 3 (not sure) or 4 (agree) against the alternative that it is greater than 3 or 4.

$H_0$: The population mean = 3; $H_1$: The population mean > 3

For table of results on Third Hypothesis Testing (see appendix iii)

The sample mean value is 4.467; the test statistics t = 17.44, and the null hypothesis of the test is rejected with p-value = 0.000.

$H_0$: The population mean = 4; $H_1$: The population mean > 4

The sample mean value is 4.467; the test statistics t = 5.55, and the null hypothesis of the test is rejected with

p-value = 0.000.

Therefore, in the first test, respondents reject that the population mean of the third hypothesis is on average 3 (Not sure) in favour of the alternative that is it greater than 3 (better than Not sure).

In the second test, respondents reject that the population mean of the third hypothesis is on average 4 (agree) in favour of the alternative that is it greater than 4 (better than agree).

Hence, evidence that the respondents almost strongly agree that there is association between a Super Highway and socio-cultural affinity of the people in the ECOWAS sub-region.

For graph showing the distribution of the three measures in a box plot (see appendix IV).

The graph shows that 75% of the respondents were more than agree (almost strongly agree) with first and third hypotheses. While more than 50% of the respondents were either not sure or agree with the second hypothesis.

## 5. Conclusion, Limitations and Policy Implication of the Study

The ECOWAS, just like any other economic bloc, has had its challenges as it strives for regional integration. However, these challenges have negatively impacted on the sub-region's propensity to provide economic benefits to the people of the region. Results from this study indicate a strong association between a super Highway and improve economic integration in the ECOWAS sub-region. Our study further reveals that a Super Highway will serve to promote political stability within the ECOWAS sub-region, although not to a significant extent. While it is generally viewed that the biggest threat to the solidarity of ECOWAS members has been internal and comes from the cultural divide between its Francophone and Anglophone members, result from this study shows that the challenge of language will be highly mitigated if an ECOWAS Super Highway is in place as this will aid in bridging the cultural divide that has existed between the Anglo-Phone and Franco-Phone members through increased travel and cultural exchange. However, a major limitation in empirical research is in its ability to demonstrate the presence or absence of actual bias, even at a systemic level (Van Harten, 2011). Despite this limitation, the categories of sample population selected for this study was intended to minimize the level of bias inherent in empirically-based surveys. As a policy-driven research, this study has implications for theory and practice. The study makes original contribution to knowledge as the empirical literature is enriched. Furthermore, the study provides a platform that brings the ECOWAS Super Highway conundrum to both regional and International conversations. From a public policy perspective, the majority of the citizens of ECOWAS member States view the absence of a super Highway as a major governance default by leaders of the countries in the sub-region which needs to be addressed as a matter of priority. The study, therefore, also highlights the need to institute measures to revisit the original dream of building a Super Highway from Lagos to Dakar by taking advantage of International Funding Agencies to compliment individual countries' contributions. What is needed, therefore, is the political will by leaders to achieve genuine regional integration as was envisioned by the founding fathers of ECOWAS so as to fast track the socio-economic development of the region and deliver to the peoples of the region the "nirvana" promised at the 1975 launch of the Community.

**References**

Abuhamoud M. A. A., Rahmat R. and Ismail A. (2011). "Transportation and its concerns in Africa: A review", *The Social Sciences*, Vol. 6, No. 1, pp. 51-63.

Agbonkhese A. O. and Adekola A. (2014). "Regional economic integration in developing countries: A case study of Nigeria", A Member of ECOWAS, *European Scientific Journal*, Vol. 10, No. 19.

Ajakaiye O. and Ncube M. (2010). "Infrastructure and economic development in Africa: An overview", *Journal of African Economies*, Vol. 9, No. 1, pp. 3-12.

Alao D. O., Olusegun A. C., Ayomola O., Eyitayo A. and Irewumi B. A. (2012). "An analysis of the achievements of economic community of West African States since inception", *Singaporean Journal of Business, Economics and Management Studies*, Vol. 51, No. 1107, pp. 1-12.

Anger B. (2010). "Poverty eradication, millennium development goals and sustainable development in Nigeria", *Journal of Sustainable Development*, Vol. 3, No. 4, p. 138.

Bamfo N. (2013). "The political and security challenges facing 'ECOWAS' in the twenty-first century: Testing the limits of an organization's reputation", *International Journal of Humanities and Social Science*, Vol. 3, No. 3, pp. 12-23.

Bolarinwa J. O. (2015). "The ECOWAS free movement protocol: Obstacle or driver of regional integration?", *Insight on Africa*, Vol. 7, No. 2, pp. 154-168.

Butu A. (2013). "Impact of ECOWAS protocols on political and economic integration of the West African sub-region", *International Journal of Physical and Human Geography*, Vol. 1, No. 2, pp. 47-58.

Chingono M. and Nakana S. (2009). "The challenges of regional integration in Southern Africa", *African Journal of Political Science and International Relations*, Vol. 3, No. 10, pp. 396-408.

Fayomi O. and Adeola G. L. (2016). "ECOWAS and sub-regional integration in West Africa: An appraisal", *Covenant University Journal of Politics and International Affairs*, Vol. 3, No. 2.

Fulgence N. (2015). "War on terrorism in Africa: a challenge for regional integration and cooperation organizations in eastern and western Africa", *Journal of Political Sciences & Public Affairs*.

Geda A. and Kebret, H. (2008). "Regional economic integration in Africa: A review of problems and prospects with a case study of COMESA", *Journal of African Economies*, Vol. 17, No. 3, pp. 357-394.

Hirsch A. (2013). "Senegal to Nigeria super highway still stuck in a rut", accessed on 04/01/2018, available online at: https://www.theguardian.com/global-evelopment/2013/apr/18/senegal-nigeria-superhighway-stuck-rut.

Ntara C. K. (2016). "African trading blocs and economic growth: A critical review of the literature", *International Journal of Developing and Emerging Economics*, Vol. 4, No. 1, pp. 1-21.

Ogbonna C., Aluko B. and Awuah K. (2013). "The ECOWAS platform and the persisting challenges of integrating the West African Region: A discourse", *Journal of Economics and Sustainable Development*, Vol. 4, No. 1.

Okom M. P. (2016). "Economic integration in ECOWAS: 40 years after", *European Scientific Journal*, Vol. 12, No. 19.

Rönnbäck A. S. (2008). "ECOWAS and West Africa's future: Problems or possibilities?", in: *Statsvetenskap*.

Samimi P. and Jenatabadi H. S. (2014). "Globalization and economic growth: Empirical evidence on the role of complementarities", *PloS one*, Vol. 9, No. 4, p. e87824.

Sampson N. and Imoh-Ita I. (2014). "Globalization and the challenges of regional integration: The case of ECOWAS region", *IMSU Business Journals*.

Sesay A. and Omotosho M. (2011). "The politics of regional integration in West Africa", West Africa Civil Society Institute.

Sideri S. (2007). "Globalization and regional integration", *The European Journal of Development Research*, Vol. 9, No. 1, pp. 38-82, doi: 10.1080/09578819708426677.

Udoh O. (2015). "Integration and politics among West African States: The Nigerian experience", *Pearl Journal of Management, Social Science and Humanities*, Vol. 1, No. 1, pp. 30-41.

Van Harten G. (2011). "Contributions and limitations of empirical research on independence and impartiality in international investment arbitration".

Wenjing W., Rongcheng W., Ayenagbo K., Nguhi S., Kimatu J. N. and Patrick J. M. (2012). "The impact of globalization on African countries economic development", *African Journal of Business Management*, Vol. 6, No. 44, p. 11057.

Zagaris B. (1978). "The Economic Community of West African States (ECOWAS): An analysis and prospects — Case of Western Reserve", *Journal of International Law*, Vol. 10, No. 1, pp. 93-122.

# Appendices

**Appendix 1   Tables of Results of First Hypothesis Testing**

| One-sample statistics | | | |
|---|---|---|---|
| | N | Mean | Std. deviation | Std. error mean |
| HYP_1 | 50 | 4.3300 | .55888 | .07904 |

| One-sample test | | | | | | |
|---|---|---|---|---|---|---|
| | Test Value = 3 | | | | | |
| | T | Df | Sig. (2-tailed) | Mean difference | 95% confidence interval of the difference | |
| | | | | | Lower | Upper |
| HYP_1 | 16.827 | 49 | .000 | 1.33000 | 1.1712 | 1.4888 |

The sample mean value is 4.33; the test statistics t = 16.83, and the null hypothesis of the test is rejected with p-value = 0.000.
$H_0$: The population mean =4; $H_1$: The population mean > 4

| One-Sample Statistics | | | | |
|---|---|---|---|---|
| | N | Mean | Std. deviation | Std. error mean |
| HYP_1 | 50 | 4.3300 | .55888 | .07904 |

| One-Sample Test | | | | | | |
|---|---|---|---|---|---|---|
| | Test Value = 4 | | | | | |
| | T | Df | Sig. (2-tailed) | Mean difference | 95% confidence interval of the difference | |
| | | | | | Lower | Upper |
| HYP_1 | 4.175 | 49 | .000 | .33000 | .1712 | .4888 |

**Appendix 2   Tables of results of Second Hypothesis Testing**

| One-Sample Statistics | | | | |
|---|---|---|---|---|
| | N | Mean | Std. deviation | Std. error mean |
| HYP_2 | 50 | 3.8800 | .72534 | .10258 |

| One-Sample Test | | | | | | |
|---|---|---|---|---|---|---|
| | Test Value = 3 | | | | | |
| | T | Df | Sig. (2-tailed) | Mean difference | 95% confidence interval of the difference | |
| | | | | | Lower | Upper |
| HYP_2 | 8.579 | 49 | .000 | .88000 | .6739 | 1.0861 |

**Appendix 3   Tables of results of Third Hypothesis Testing**

**T-Test**

| One-Sample Statistics | | | | |
|---|---|---|---|---|
| | N | Mean | Std. Deviation | Std. Error Mean |
| HYP_3 | 50 | 4.4667 | .59476 | .08411 |

| One-Sample Test | | | | | | |
|---|---|---|---|---|---|---|
| | Test Value = 3 | | | | | |
| | T | Df | Sig. (2-tailed) | Mean difference | 95% confidence interval of the difference | |
| | | | | | Lower | Upper |
| HYP_3 | 17.437 | 49 | .000 | 1.46667 | 1.2976 | 1.6357 |

The sample mean value is 4.467; the test statistics t = 17.44, and the null hypothesis of the test is rejected with p-value = 0.000.
H_0: The population mean = 4; H_1: The population mean > 4

**T-Test**

| One-Sample Statistics | | | | |
|---|---|---|---|---|
| | N | Mean | Std. deviation | Std. error mean |
| HYP_3 | 50 | 4.4667 | .59476 | .08411 |

| One-Sample Test | | | | | | |
|---|---|---|---|---|---|---|
| | Test Value = 4 | | | | | |
| | | | | | 95% confidence interval of the difference | |
| | T | Df | Sig. (2-tailed) | Mean difference | Lower | Upper |
| HYP_3 | 5.548 | 49 | .000 | .46667 | .2976 | .6357 |

The sample mean value is 4.467; the test statistics t = 5.55, and the null hypothesis of the test is rejected with p-value = 0.000.

**Appendix 4   Graph Showing The Distribution of the Three Measures in a Box Plot**