

Fiscal Federalism and Economic Welfare in Nigeria: an Econometric Analysis.

By

¹Dr. Eshenake S.J. and ¹Dr. Oyovwi O. Dickson

Abstract

The objective of this paper is to investigate the effects of fiscal federalism on economic welfare in Nigeria between 1970 and 2009 using an econometric approach. The ordinary least square (OLS) technique is adopted. The Augmented Dickey-Fuller test was used to test for unit root and it was discovered that all the variables are I (I) except Fiscal Autonomy Ratio (FAR) that is I (O). Also the Johansen co-integration test was used to test for the long term properties of the variables and the result shows that there exist a long-run relationship between measures of FD and PCI. The short-run dynamic result shows that measures fiscal decentralization have mixed relationship with Per capita income with R^2 of 0.907 and F-statistic of 30.26. The dummy variable shows that there is a significant difference between civilian and military regimes with respect to fiscal decentralization and economic welfare in Nigeria during the period of study. The study recommends among others that the National Revenue mobilization, Allocation and Fiscal Commission (NRMAFC) should be independent and be allowed to meaningfully undertake its functions regarding fiscal relationship between the various levels of government.

Keywords: Fiscal Federalism and Economic Welfare;

1. Introduction

Federation implies the existence in one country of more than one level of government, each with different expenditure responsibilities and taxing powers (Ekpo, 2004). In the Nigeria context, this consists of a federal government, 36 states, federal capital territory and 774 local governments. The fiscal arrangement among the different tiers of government in a federal structure is often referred to as fiscal federalism.

Conceptually, fiscal operations of any economy can be viewed from two extreme forms of the public sector. On one hand, there exists a highly decentralized fiscal system in which the government at the centre has no economic functions. The other tiers of

| ¹ Economics Department, College of Education, Warri, Delta State, Nigeria
TEL: 08067518238

government perform virtually all economic functions. The other extreme is a case of total centralization where the central government takes total responsibility for all economic activities of the public sector and therefore no other tiers of government participate in the economic life of the nation. In practice, there exists some degree of decentralization in all economies (Ekpo, 1999).

Mowhood (1983) and Smith (1985) defined decentralization as any act by which central government formally cedes power to actors and institutions at lower levels in political administrative and territorial hierarchy. The objective as argued by Ribot (2002) includes downsizing central government by increasing local participation in democracy and strengthening local government.

The introduction of a democratic experiment in 1999 re-echoed the problems of intergovernmental fiscal arrangement among the different levels of government. The issues of revenue allocation and the sharing formula have generated such intense debate that led to the demand of a national conference. It was during this period that the 'resource control' phenomena rose to an unprecedented dimension such that the struggle for political power become the fight for resource control. Hence, the democratic experiment has created 'new' problems; the interference by the executive arm of government on the functions of the National Revenue Mobilization Allocation and Fiscal Commission (NRMAFC) on the appropriate revenue-sharing formula among the different levels of government, the debate regarding the correct interpretation of the section of the 1999 constitution affecting the derivation principle, among others have posed challenges for Nigeria's fiscal federalism (Onah and Ukwueze,nd). It is the thinking of most Nigerians that with fiscal decentralization, economic welfare of Nigerians will be automatic.

In view of the above, it is pertinent to ask some fundamental questions. Such questions include but not limited to:

What impact has fiscal federalism (fiscal decentralization) had on economic welfare of Nigerians?

Is there any difference between the impact of fiscal federalism on the economic welfare of Nigerians during military and civilian regimes?

Answers to the above questions will help to direct scholarly debate on relevance of fiscal federalism in Nigeria. Two hypotheses have been formulated to guide this study Viz:

Ho: There is no significant relationship between fiscal decentralization (proxied by the number of states, the number of local governments, expenditure concentration ratio; revenue concentration ratio; and fiscal autonomy ratio) and economic welfare proxied by per-capita income.

Ho: There is no significant difference between the impact of fiscal decentralization (proxied by the number of states, the number of local governments, expenditure concentration ratio; revenue concentration ratio; and fiscal autonomy ratio) and economic welfare during military rule and civilian rule.

While part one of these papers is on introduction, part two deals with literature review. Part three is research design, presentation and discussion of findings while the last part is, on conclusion and recommendations.

2. Literature Review

A first argument favouring FD is the “diversification hypothesis” (or “decentralization theorem”). It maintains that uniform levels of public goods and services across jurisdictions will generally be inefficient (Oates, 1972, 1977).

Resources can be saved without making anybody worse off by diversifying government outputs in accordance with local demands, i.e. decentralized expenditures may cause greater “consumer efficiency” (Vazquez and Mc Nab, 2001). The potential welfare gain of this diversification may be relatively large because it depends negatively on the price elasticity of demand for public goods and empirical studies find that this demand is highly price inelastic (see Oates, 1996, for an overview). Hence, ‘Pareto’ efficiency can be raised through fiscal decentralization. In other words, local government outputs need to be differentiated according to local tastes and circumstances but this requires discretion of local governments over spending programs, i.e. fiscal decentralization.

Oates (1993) argued that the thrust of the basic case for fiscal decentralization (greater allocative efficiency) should also apply to a dynamic framework of economic growth. It could be expected that centrally determined policies consider regional and local conditions in the provision of public goods and services less well than locally determined policies, for instance regarding infrastructure and education. Economic development and growth might therefore be promoted if local authorities have input into such policy decisions.

A second argument calling for fiscal decentralization is the “Leviathan restraint hypothesis”: Brennan and Buchanan (1980) argued that governments may behave as revenue-maximizers to the detriment of taxpayers. Horizontal and vertical competition among different levels of government may prevent this revenue maximization. Competing governments may concentrate on other objectives than revenue maximization such as maintaining stable or even lowering tax rates and efficient production of public goods and services under certain revenue constraints. Hence, FD may contribute to containing the size of their budgets and thus restrain the overall size of the public sector. Thus, FD should have a positive impact on per capita growth due to more efficient use of resources.

A third argument supporting the view that FD promotes economic growth is the “productivity enhancement hypothesis”: FD implies a transfer of responsibility associated with accountability to sub-national governments. This may provide incentives for them to not only consider local preferences of residents but to search actively for innovations in the production and supply of public goods and services. Production costs and prices of public goods and services could thus be lowered and their quality better than in a uniform approach to providing public goods and services, i.e. fiscal decentralization may result in greater “producer efficiency” (Vazquez and Mc Nab, 2001). In addition, fiscal decentralization relieves the central government from many tasks. Thus, the latter may be able to better concentrate on efficient production of those public goods and services for which it still bears responsibility (ideally goods and services with large spill-overs among communities and/or substantial economies of scale in production).

Fourth, there are also political arguments such as the view that fiscal decentralization lessens concentration of political power, weakens the influence of vested interests on public policy.

On the other hand, there are significant arguments cautioning against fiscal decentralization. First, FD can reinforce regional inequalities, which may hinder economic growth. The argument in some studies showed that FD breeds social inequity: incomes and tax bases are unevenly distributed among jurisdictions and regions. Wealthier communities and regions are attempting to fend off low-income households and may offer better public services. Such inequities and differences in the supply of public goods with possibly large spill-overs across jurisdictions can inhibit per capita growth. This is because pronounced regional differences in infrastructure, education, health care and other public services may prevent full use of production factors including human capital.

Secondly, FD may result in lower quality of government decisions, more corruption, and increased influence of interest groups. If the quality of government declines with the level of government, then decentralization could increase inefficiencies. If the quality at all government levels is high, the case for decentralization may be weakened because it could be argued that the central government may be able to collect and process the information necessary to achieve those efficient results that are expected from decentralization.

Thirdly, there are arguments cautioning against fiscal decentralization in low income and small countries, Fixed costs could consume such a large share of the total funds available, that decentralization might seem difficult to be justified (Prud'homme 1995). Bahl and Linn (1992) argued that there is a relatively high threshold level of economic development at which fiscal decentralization becomes attractive. This level is not only due to fixed costs of FD but also because at a relatively low per capita income level, the demands for public goods and services may be concentrated on very few goods, the outlooks of all inhabitants may be relatively homogeneous, i.e. differences in individual preferences for public goods and services may not be pronounced and have a small variance so that the central government has all information necessary to provide for consumer and producer efficiency.

Fourth and finally it could be that FD hinders long run economic growth through making the stabilization task more difficult when interpreting this task to include not only counter-cyclical actions, but especially fiscal adjustments needed to eliminate structural (chronic) fiscal imbalances. FD may even create perverse incentives and worsen structural imbalances (Tanzi, 1995): One extreme example is when one government level grants an exemption to a tax, the revenue of which is in large part received by another level of government. It may even contribute to predatory and unpredictable taxation (such as in Russia, see Zhuravskaya, 2000) promoting shadow economic activities. Furthermore, effective and timely co-ordination among the different government levels may be difficult to implement, which could also have long run adverse growth effects.

Thus, the benefits of FD for society and its relationship with economic growth are theoretically ambiguous. FD causes shortcomings, which require central government intervention. It thus follows that in advanced countries, whose citizens have pronounced

heterogeneous demand preferences; neither a highly decentralized nor a highly centralized system promotes long run per capita growth best but a decentralized system with “adequate” central government interventions. This adequacy refers to avoiding negative effects from “too much” regional autonomy and inequality, on the one hand, and from “too limited” fiscal autonomy, responsibility and accountability of sub-national governments, on the other. Assuming a satisfactory indicator of fiscal decentralization were available, the conclusion would be that on a macroeconomic level a medium degree of decentralization promotes growth better than either a relatively high or low degree.

3. Research Design, Presentation and Discussion of Results

In this section, we specify our models that will enable us test our hypotheses. Also presented are our result and discussion of findings.

3.1 Research Design

This study is being an empirical macro-econometric study, Ordinary Least Squares (OLS) technique is adopted. And as macro-economic time series data have been known to be generally non-stationary (possesses unit roots), the traditional partial adjustment model of estimation of parameter coefficients has been found to produce “spurious” or “nonsense” regression. Consequently, the modern co-integration and error correcting model will be used.

In order to achieve our general and specific objectives of this study, we have carefully selected our dependent and independent variables from our theoretical literatures and framework as a guide.

Per Capita Income

Per capital income is used as a proxy for welfare. According to Ohale and Onyema (2001), Per Capital Income is also known as income per capita or income per head. It generally gives an idea of how much income will each individual Nigerians get, if it were equitably distributed. It is derived by dividing the year’s national income by the entire population of a country.

$$\text{That is, Per Capita Income} = \frac{\text{National Income}}{\text{Population}}$$

Per Capita Income is a standard of measurement of welfare. Higher per capita income is suggestive of a higher level of welfare. Lower per capita income suggests a lower level of welfare. However, being an ‘average’ it is not an accurate measure of economic welfare as it hides inequality in income distribution. However, despite the shortcomings of per capita income as a measure of welfare, it remains the most suited in view of the empirical nature of the study.

Vector of Fiscal Decentralization Variables

The vector of fiscal decentralization in used as independent variables.

Jimoh (2003) identified measures of fiscal decentralization as number of states (STA); number of local governments (LGA); expenditure concentration ratio (ECR); revenue concentration ratio (RCR); and fiscal autonomy ratio (FAR). The numbers of states and

local government areas have increased over the years. Now, Nigeria has 36 states and Federal Capital Territory, which is treated like a state and 774 local governments' areas nationwide. The objective of creating states and local governments is to bring development and governance to the grassroots. It is expected to have positive effect on PCI. Expenditure concentration ratio is measured by the share of total federal expenditures in the total expenditure of all tiers of government. The smaller the share of federal government expenditure, the higher the PCI, and lower the unemployment rate. Revenue concentration ratio is measured by the share of federal government from the total federally collected revenue. The lesser the share of federal government the higher the PCI.

Fiscal autonomy ratio is measured by the internally generated revenue of states as a percentage of their total expenditure. The expected sign is positive for PCI.

Model Specification

In order to analyze more closely the links between fiscal decentralization and economic welfare, we adopt Jimoh (2003) but with some modifications. We will use, Per Capita Income as indicators of economic welfare.

We use measures of extent of government decentralization – the number of states (STA), number of local governments (LGA), expenditure concentration ratios (ECR), revenue concentration ratio (RCR), and measure of fiscal autonomy ratio (FAR) as explanatory variables. Thus, we specify economic welfare (PCI) as:

$$PCI = f(STA, LGA, ECR, RCR, FAR, DUMMY) \tag{1.1}$$

Where:-

PCI = Real Per Capita Income

STA = Number of States

LGA = Number of Local Government Areas

ECR = Expenditure Concentration Ratio

RCR = Revenue Concentration Ratio

FAR = Fiscal Autonomy Ratio

DUMMY = 0 for years of military rule and 1 for years of civilian rule

The equation 1.1 assumes natural logarithm form as shown in equation 1.2

This is because the measurements of the proxies for the variables are not uniform. For example, whereas, the variable, real gross domestic product (GDP), is recorded in monetary values; other variables such as number of states and local governments are not. Also, some other variables are recorded as ratios such as Expenditure Concentration Ratio (ECR). In situation like this, it is advisable to take the natural logarithms of all the variables so as to bring them to the same base. We opted for the log-model in order to reduce the problem of multicollinearity. Also, the log-model will help give the variables a uniform scale. Thus, functional equation 1.1 is stated in its log form as shown in equation 1.2.

$$\text{LnPCI} = b_0 + b_1 \text{LnSTA} + b_2 \text{LGA} + b_3 \text{Ln ECR} + b_4 \text{Ln RCR} + b_5 \text{LnFAR} + b_6 \text{DUMMY} + \varepsilon$$

.....1.2 Such that: $b_1, b_2, b_5 > 0$; $b_3, b_4 < 0$

3.2 Presentation and Discussion of Results: Findings

Unit Root Tests

The unit root test is carried out to find out the stationarity of the time series data. We adopted the Augmented Dickey-Fuller (ADF) test to test for unit root. As can be seen from appendix 1, all the variables are stationary after the first difference except Fiscal Autonomy Ratio (FAR) that is stationary at levels. Therefore, to avoid spurious regressions, we conducted a cointegration test of both the I (1) and I (0) variables using the Johansen cointegration test

Cointegration Test

The summary of the co-integration result is shown in appendix 2. The Johansen Cointegration test suggests that there are four (4) and three (3) cointegrating equations at 5% and 1% respectively. In all, the cointegration result implies that there exist a long-run relationship between measures fiscal decentralization and Per Capita Income (PCI),

SHORT-RUN DYNAMIC RESULT

Table 1: Summary of OLS Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LSTA	-3.275813	2.264240	-1.446760	0.1591
LSTA(-1)	-0.011489	0.792712	-0.014493	0.9885
LSTA(-2)	3.343815	1.699771	1.967216	0.0591
LGA	0.005907	0.003565	1.657257	0.1086
LGA(-2)	-0.005447	0.002470	-2.205212	0.0358
LECR	2.376804	0.738565	3.218137	0.0033
LRCR	-1.614151	0.240940	-6.699401	0.0000
LFAR	-0.466654	0.111772	-4.175055	0.0003
DUMMY	0.844961	0.300682	2.810148	0.0089
C	1.485447	5.432416	0.273441	0.7865
R-squared	0.906777	Mean dependent var		7.531469
Adjusted R-squared	0.876813	S.D. dependent var		1.046450
S.E. of regression	0.367283	Akaike info criterion		1.055566
Sum squared resid	3.777111	Schwarz criterion		1.486510
Log likelihood	-10.05576	F-statistic		30.26181
Durbin-Watson stat	1.505387	Prob(F-statistic)		0.000000

Source: computed by author using e-view 4.0

Table I shows the estimated result of the OLS model. From the above table, our *a priori* expectations were mixed. Although STA shows a negative sign instead of the expected positive sign, STA(-2) shows the expected positive sign. That means that it will take at least two years before states will start impacting on per capita income. LGA shows the expected positive sign while RCR showed the expected negative sign. However, fiscal autonomy ratio (FAR) shows a negative sign against our expectation. Also, ECR shows

positive sign instead of negative. The result shows that LGA(-2), ECR, RCR, FAR and dummy are statistically significant while STA and LGA are not. Although not significant, a unit increase in STA will reduce PCI by 3.3 units while a unit increase in LGA will increase PCI by 0.006 units. However, the lag-2 of STA, though not significant will increase PCI by 3.3 units if there is a unit increase. Meanwhile LGA (-2) shows a negative relationship with PCI, although significant. That is, if there is one unit increase in LGA (-2), it will cause 0.006 units decrease in PCI. Expenditure concentration ratio (ECR) is positively related to PCI and statistically significant. A unit increase in ECR will increase PCI by 2.4 units. On the other hand, revenue concentration ratio (RCR) is negatively related to PCI and statistically significant. Fiscal autonomy ratio (FAR) is statistically significant, although, it is negatively signed. A unit increase in FAR will reduce PCI by 0.47 units. Dummy variable is positively signed and statistically significant. This means that the second Null hypothesis is rejected.

The R^2 of 0.906777 shows that the selected explanatory variables explained 91% of the variations in the PCI. The F – statistics of 30.26181 is satisfactory. The model demonstrates a good fit. The Durbin-Watsan of 1.505387 shows the absence of serial correlation.

Three diagnostic tests such as stability test(CUSUM), normality tests (Jarque-Bera) and white heteroskedasticity test were conducted. The test results are attached as appendix 6, 7 and 8 respectively. It implies that the variances of the errors are constant and normally distributed. That is, the model is stable, normal, and shows absence of heteroskedasticity.

Discussion of Findings

From table I, number of states (STA) is negatively related to PCI but not statistically significant. The states in Nigeria are more like agents of impoverishment rather than welfare generating. Revenues meant for developmental programmes are diverted for private use, misappropriated and misapplied. This is evident in the number of money laundry and corruption cases instituted by Economic and Financial Crimes Commission (EFCC); and Independent Corrupt Practices Commission (ICPC) against majority of former civilian governors who ruled between 1999 to 2007. Also, number of local governments (LGA) is positively related to PCI, albeit not statistically significant. The non- significance of LGA in explaining variations in PCI in Nigeria is clear. Local governments in Nigeria are economically strangled by state governors through the “joint account” constitutional requirement. This justifies the current clamour for constitutional review in making local governments constitutionally autonomous, such that they can directly receive their allocations from the federal government. In fact, LGA(-2) is negatively related to PCI and statistically significant. That is, local government activities in the previous two years reduces per capita income. It means that it helps to aggravate poverty instead of alleviating it.

However, expenditure concentration ratio (ECR) is positively related to PCI and statistically significant. It means that the expenditure of federal government have increased PCI and thereby improving economic welfare. On the other hand, the concentrations of revenues in the hands of federal government have reduced PCI and thereby aggravates poverty in Nigeria during the period under study 1970 to 2009. This is

the case the state governors are currently making for the review of the revenue sharing formula which is currently heavily tilted in favour of the federal government such that states and local governments will get more from federation accounts. Fiscal autonomy ratio (FAR) also helps to reduce PCI during the same period.

Through the dummy variable, it was discovered that there is a significant differences between civilian and military regimes in improving the welfare of Nigerians. The result shows that economic welfare of Nigerians were better improved during civilian regime.

4. Conclusions and Recommendations

4.1 Conclusions

The clamour for fiscal decentralization or what Nigerian politicians call “true federalism” is based on the thinking that it will improve the economic welfare of Nigerians. However, the literature is not conclusive on this assertion. While a school of thought asserts that fiscal decentralization promotes economic growth, another school of thought argues otherwise.

The findings of this study is also mixed. While STA is negatively related PCI but not significant while LGA is positively related to PCI but also not significant. However, ECR is positively related to PCI and statistically significant while RCR and FAR reduces PCI.

4.2 Recommendations

Based on the findings of this study, the following recommendations are made for policy purposes so as to broaden and deepen fiscal federalism in Nigeria.

A complete review of the functions of each level of government will be very necessary. Such a review should take cognizance of the respective capabilities of each level of government to perform services assigned it most effectively and efficiently. In this regard functions that are grassroots-based, like primary education, primary health care and agricultural production, should be wholly assigned to local governments.

A new revenue allocation formula which will drastically reduce the current concentration of revenue in the hands of federal government must be adopted. In doing this, the 68 items currently under the control of the federal government through the exclusive legislative list should be critically re-examined. However “the federal government” in the process, ‘should not be too emasculated as to become unable to carryout its functions of uniting the people.

The National Revenue Mobilization, Allocation and Fiscal Commission (NRMAFC) as a permanent body and one of the policy instruments in Nigeria for the achievement of national objectives must be independent and meaningfully undertake, on a continuous basis, its functions regarding the fiscal relationship between the various levels of government to minimize the existing political pressures and enhance the achievement of national, economic and growth objectives.

State and local governments to put machineries in place to improve on their internally generated revenue instead of depending more on statutory allocations from federation account.

Local governments must be given some degree of financial autonomy. In other words, the infringement of the revenue rights of local governments particularly by the states should be checked. Any transfers from the federation account and states to local governments, statutorily determined should be enforced. Equally, all revenues accruing to local governments should be transferred directly to them. In other words, the provision of Section 162(5) of the constitution should be reviewed.

References

- Bahl, R. W., and Linn, J. F. (1992), *Urban Public Finance in Developing Countries*, New York.
- Brennan, G, and Buchanan, J. (1980), *The Power to Tax: Analytical Foundations of a Fiscal Constitution*, Cambridge, U.K.
- Ekpo, A. H., (2004), "Intergovernmental Fiscal Relations: The Nigerian Experience", Paper presented at the 10th year anniversary of the Financial and Fiscal Commission of South Africa, Capetown, 10-12 August.
- Ekpo, H. (1999) "Fiscal Federalism and Local Government Finance) in Emenuga, Chidozie (1993) "Nigeria: In Search of Acceptable Revenue Allocation Formula" The National Question and Economic Development in Nigeria, Nigerian Economic Society (NES), Ibadan Nigeria" in NES. Ibid.
- Mawhood, P., (1983), *Local Government in the Third World*, Chichester: John Wiley.
- Oates, W. (1972), *Fiscal Federalism*, New York: Harcourt Brace Jovanovich.
- Oates, W. E. (1977), "An Economist's Perspective on Fiscal Federalism," in: W. E. Oates (ed.), *The Political Economy of Fiscal Federalism*, Lexington, Toronto.
- Oates, W. E. (1993), "Fiscal Decentralization and Economic Development," *University of Maryland, Working Paper No. 93-4*, May.
- Oates, W. E. (1996), "Estimating the demand for public goods: The Collective Choice and Contingent Valuation Approaches," in: Bjornstad, D., and J. Kahn (eds.), *The Contingent Valuation of Environmental Resources*.
- Prud'homme, R. (1995), "Comment on 'Conflicts and Dilemmas of Decentralization' by Rudolf Hommes," in: Bruno, Michael, and Boris Pleskovic (editors), *Annual World Bank Conference on Development Economics 1995*, World Bank, Washington, D.C.
- Ribot, J.C. (2002). "African Decentralization: Local Actors, Powers and Accountability," United Nations Research Institute on Social Development (UNRISD) Programme on Democracy, Governance, and Human Rights, Paper No. 8. Geneva: UNRISD.
- Smith, Brian C, (1985), *Decentralization: The Territorial Dimension of the State*, London: George Allen.
- Tanzi V., (1995), "Fiscal Federalism and Decentralization: A Review of Some Efficiency and Macroeconomic Aspects". In: Bruno, M. and B. Pleskovic, (eds.) *Annual Work Bank Conference of Development Economics*, World Bank.
- Tanzi V., (1995), "Fiscal Federalism and Decentralization: A Review of Some Efficiency and Macroeconomic Aspects". In: Bruno, M. and B. Pleskovic, (eds.) *Annual Work Bank Conference of Development Economics*, World Bank.

Vazquez, J. M., and Mc Nab, R. M. (2001), "Fiscal Decentralization and Economic Growth," *Working Paper No. 1*, January, Andrew Young School of Policy Studies, Georgia State University.

Zhuravskaya, E. (2000), "Incentives to Provide Local Public Goods: Fiscal Federalism Russian Style," *Journal of Public Economics*, Vol. 76.

Appendix 1: Summary of ADF Unit Root Test Results

Variables	Level Data	1 st Diff	1% Critical Value	5% Critical Value	10% Critical Value	Order of Integration
RGDP	1.343560	- 3.910256	-3.6171	-2.9422	-2.6092	1(1)
PCI	_-0.872493	- 4.875961	-3.6171	-2.9422	-2.6092	1(1)
UMPR	-1.600683	- 4.488425	-3.6171	-2.9422	-2.6092	1(1)
OPI	1.386840	- 3.902116	-3.6171	-2.9422	-2.6092	1(1)
STA	-1.125915	- 4.688715	-3.6171	-2.9422	-2.6092	1(1)
LGA	-1.289816	- 4.710533	-3.6171	-2.9422	-2.6092	1(1)
ECR	-1.475234	- 4.628591	-3.6171	-2.9422	-2.6092	1(1)
RCR	-1.211423	- 3.604489	-3.6171	-2.9422	-2.6092	1(1)
FAR	-5.592369	- 3.437329	-3.6171	-2.9422	-2.6092	1(0)
WOP	-1.197269	- 5.855341	-3.6171	-2.9422	-2.6092	1(1)
RGT	-2.658062	- 6.243399	-3.6171	-2.9422	-2.6092	1(1)
GDP	1.449487	- 5.899987	-3.6171	-2.9422	-2.6092	1(1)

Source: Computed by author using e – views 4.0

Appendix 2: Summary of Cointegration Results

Date: 10/02/03 Time: 00:52

Sample(adjusted): 1972 2009

Included observations: 38 after adjusting endpoints

Trend assumption: Linear deterministic trend

Series: LR GDP LOPI LSTA LGA LECR LRCR L FAR LUMPR

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.850295	230.0434	156.00	168.36
At most 1 **	0.722628	157.8779	124.24	133.57
At most 2 **	0.644662	109.1468	94.15	103.18
At most 3 *	0.512890	69.82874	68.52	76.07
At most 4	0.467396	42.49666	47.21	54.46
At most 5	0.267291	18.55753	29.68	35.65
At most 6	0.162400	6.739257	15.41	20.04
At most 7	0.000134	0.005080	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level

Trace test indicates 4 cointegrating equation(s) at the 5% level

Trace test indicates 3 cointegrating equation(s) at the 1% level