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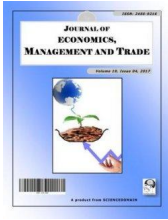
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Optimal Policy Mix for Inclusive Growth: Evidence from Nigeria

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Authors' contributions

This article is the fruit of collaborative efforts of all authors. Authors SOO and ODM designed the study and prepared the rationale for the study. Authors ANI and KOA carried out the statistical analysis of the data while authors DCO and JEO undertook extensive review of related literature. All authors were involved in the interpretation of the results of data analysis, drafting of the initial manuscript and approval of the final manuscript.

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ABSTRACT

Unresolved issues on choice of optimal policy mix for inclusive growth pose intractable problems to policy-makers. Search for solution has continued in the present study which focused on extracting common or specific factor with proper combination of fiscal and monetary measures that could foster inclusive growth. Study spanned across 1980-2016. Data were sourced from Central Bank of Nigeria, National Bureau of Statistics, Abuja and World Development Indicators. Exploratory factor analysis technique was used to analyze the data. Results indicate that: (1) Optimal policy mix, compatible with inclusive growth, is expansionary fiscal-expansionary money which blended company income tax, recurrent expenditure, money supply, domestic debt, credit to private sector, custom and exercise duties, net loans and advances, exchange rate, federally collected revenue,

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capital expenditure and petroleum profit tax in exact proportion of their respective regression weights (2) Decelerator policy mix undermined the effectiveness of optimal policy mix (3) Rising demand for money induced external borrowing which failed to impact significantly on growth. The study concluded that the determination of optimal policy mix that fosters inclusive growth justifies Keynes's MEC theory as a valid theoretical framework for the study. It was recommended, inter alia, that Macroeconomic Policy Committees be domiciled in finance ministries for effective coordination of fiscal and monetary policies.

Keywords: Fiscal policy; monetary policy; expansionary fiscal; expansionary money; decelerator.

JEL Codes: E52, E62, E63

1. INTRODUCTION

A policy mix is a contemporaneous joint state of monetary and fiscal policy which is laying a solid foundation for future economic performance [1]. A proper combination of fiscal and monetary policies is a sine qua non for building a vibrant financial system. A well-developed financial system ensures that there is a proper coordination between the activities of fiscal and monetary authorities. No country can ever hope to achieve sustainable growth and development without a well-developed financial system which facilitates a combination of fiscal and monetary policies in a proper mix that guarantees full utilization of financial resources within the economy. Samuelson and Nordhaus [2] had stated that macroeconomic policy has two major tools-monetary policy and fiscal policy which can be used to affect the overall level of GNP and its composition in an economy by varying the mixture of taxes, spending and money supply.

Lack of synergy between fiscal and monetary authorities has become a common global phenomenon. In almost all the countries of the world, developed and developing, maintaining a balance between monetary and fiscal policies has continued to pose a great deal of challenges to financial experts and policy-makers. The insulation of apex banks in these countries against political interference, implicit in their independence or autonomy, allows them a great deal of flexibility and confers on them wide powers to make far-reaching decisions on interest rates. Often, these decisions are at variance with those of the fiscal authorities, thereby leading to contradictory fiscal and monetary policies that negate the efforts of policy-makers to achieve their avowed objectives. Along with this line, Samuelson and Nordhaus had averred that monetary and fiscal policies are not coordinated but instead, they combat each other resulting in a macroeconomic

policy mix that few would recommend. The fiscal-monetary policy mix in Nigeria for the period, 2007-2016 has been presented in Table 1.

Table 1 shows a pattern characterized by stagflation, i.e., high inflation in periods of high unemployment. Also, as can be seen in the table, fiscal policy aimed at raising tax revenues to fund huge expenditure to reduce unemployment while monetary policy relied on high lending rate, high treasury bill rate to reduce the money supply and so curb inflation. Notably, however, as is still evident in the table, monetary policy proved ineffective to reduce money supply as rising public expenditure was strong enough to offset the effect of high lending rate and high treasury bill rate. The effect of interaction between the contradictory monetary and fiscal policy was rising general price level accompanied by rising cost that ultimately plunged the Nigerian economy into recession in 2015 leaving fiscal and monetary authorities to grapple to cope with the twin evils- inflation and unemployment. The table depicts the situation which conforms to Samuelson and Nordhaus description of the consequence of "uncoordinated monetary and fiscal policies that combat each other to yield undesirable macroeconomic policy mix."

Search for a proper fiscal-monetary policy mix for inflation and recession control has continued unabated. Four policy mix alternatives which were put in place during the period, 1980 to 1985 as a replacement for the restrictive monetary and fiscal policies had proved ineffective for controlling inflation and recession. These policy mix alternatives include loose fiscal-easy money, loose fiscal-tight money, tight fiscal-easy money and tight fiscal-tight money [1]. With the US financial crisis in 2008 and its large ripples across all countries, it was obvious that the monetary-fiscal policy mix in EU and other currency unions was also grossly ineffective for inflation and recession control in these

economies. In monetary unions, central banks set a common interest rate while fiscal policy is determined independently by member countries through prioritization of needs [3]. Thus, the crash of the international financial system that accompanied the US financial crisis had signalled the failure of orthodox model of fiscal-monetary policy mix and created the urgent need to devise a dynamic model of policy mix which would prove effective for controlling inflation and recession as well as ensuring an inclusive economic growth.

Unless a proper fiscal-monetary policy mix is evolved to focus the divergent fiscal and monetary policies to a common goal, it would be unreasonable to expect that the contradictory policies could be aligned toward full utilization of the financial resources in the economy. The consequence is that the contradictory fiscal and monetary policies would interact in such a way as to yield a precarious cumulative effect which might impede the growth potential of the economy. Therefore, there is a need for a detailed analysis of the interdependence among fiscal and monetary variables in order to identify common and specific factors which would contribute commensurably to the overall growth and development process. It is against this backdrop that the objectives of the present study have been derived.

1.1 Objectives of the Study

The study was undertaken with the broad objective of determining the optimal policy mix which would foster inclusive growth in developing economies. Specific objectives were to:

1. Identify common factors in the interrelationships among fiscal and monetary variables in a developing economy.
2. Identify specific factors in the interrelationship among fiscal and monetary variables in a developing economy.
3. Determine the constellation of fiscal and monetary variables in the common factors.
4. Determine the constellation of fiscal and monetary variables in the specific factors.

To achieve the objectives of this study, the researchers sought to answer the following research questions:

1. What are the common factors in the interrelationships among fiscal and monetary variables in a developing economy?
2. What are the specific factors in the interrelationship among fiscal and monetary variables in a developing economy?
3. What is the constellation of fiscal and monetary variables in the common factors?
4. What is the constellation of fiscal and monetary variables in the specific factors?

Certainly, the answers to these research questions would provide a suitable framework for evolving a dynamic fiscal-monetary policy mix which finds significance in ensuring synergy between fiscal and monetary authorities for removing the contradiction between fiscal and monetary policies that impede growth and development in the economy.

2. REVIEW OF RELATED LITERATURE

Related literature was reviewed under the following subheading:

- Theoretical framework
- Studies in the related field
- Summary of review

2.1 Theoretical Framework

Keynes's marginal-efficiency-of-capital (MEC) theory of trade cycle is the basic theory which provided the framework for the detailed analysis of the magnitude and direction of the relationships among growth, fiscal and monetary variables. Keynes [4], in his General Theory, had attributed the prevalence of trade cycle solely to a change in MEC which is often aggravated by accompanying changes in the other significant short period variables of the economic system. Keynes had explained that the cause of depression and unemployment in a capitalist economy is the lack of aggregate demand. He had therefore recommended that to combat depression and unemployment, there is a need to raise aggregate demand by increasing consumption and investment. According to Keynes, revival can be achieved by raising investment since consumption is stable during the short run. Similarly, the downturn in the economy is caused by fluctuation in investment which in turn is caused by fluctuation in MEC. MEC is determined by the prospective yield of capital assets which depends on the level of

investment and interest rate. Thus, fluctuations in interest rate lead to fluctuations in investment which in turn lead to fluctuation in MEC. Howbeit, Keynes was assertive that monetary policy alone could boost the interest rate to aid recovery but is not sufficient to stimulate recovery. This is because a situation of total collapse in MEC could possibly be revived through further lowering of interest rate in an economy characterized by a liquidity trap. In such situations, government stimulus in the form of expansionary fiscal policy might be needed to complement the effort of the central bank to increase aggregate demand and enhance MEC for economic recovery and inclusive growth.

The strength of Keynes's MEC theory is what was conceived by Hazlitt [5] as MEC being "vague and ambiguous." The position of the present researchers is that what is required in the present study is not the measurability of MEC. MEC was viewed in this study as reflecting the marginal efficiencies of fiscal measures and marginal efficiencies of monetary measures. Thus, MEC depends on marginal efficiencies of fiscal measures and marginal efficiencies of monetary measures and symbolically, it is expressed as: $MEC=f(ME_{\text{fiscal measure}}, ME_{\text{monetary measure}})$. Anyanwu and Oaikhenan [6] had criticized Keynes's MEC theory on the ground that it failed to explain the variations in the interest rate that determines investment behaviour. These criticisms, notwithstanding, Keynes's MEC theory was considered appropriate for the present study as it has traced the root cause of depression and unemployment to fluctuations in MEC accompanying the fluctuations in investment and interest rate. Developing countries, including Nigeria are trapped in a precarious situation of stagflation which currently has engaged the attention of financial experts and policy-makers in these countries.

2.2 Studies in Related Field

Several studies have been carried out in the area of fiscal-monetary policy mix. A brief review of recent studies on policy mix has become necessary in order to determine the extent to which the unsettled issues of policy mix alternatives have sustained the interest of researchers.

Reynolds [7] examined the implications of Mundellian revolution of 1971-86 for maintaining price stability with a greater emphasis on

microeconomic incentives of fiscal policy. His study was based on the assumption of fiscalist counterrevolution consisting of robust external debt in conformity with the Keynesian model of the Eisenhower-Nixon years. Keynes's prediction during the Eisenhower-Nixon years was that budget surpluses would increase natural savings, reduce real interest rate and eliminate the current account deficit. But results in this analysis indicate that: (1) Inflation was purely a monetary phenomenon (2) Monetary policy did not impact positively on deficit financing (3) Monetary policy resulted to high rate of inflation. The study concluded that expansionary monetary and tight fiscal policies were not effective for maintaining price stability in the US economy. Policy implication of findings is the need for balancing monetary and fiscal policies for achieving macroeconomic stability. Overemphasis on monetary policy which tended to offset the policy mix had proved ineffective for sustaining the growth of the economy. Nevertheless, this study has paved the way for determining a proper monetary-fiscal policy mix which would ensure inclusive growth and macroeconomic stability.

Togo [8] studied the relationship among debt management, fiscal and monetary policies in emerging economies. The study adopted a sovereign asset and liability management framework for identifying and managing the macroeconomic risks of uncoordinated policies. Study revealed that: (1) Weak debt management without a separate policy goal could lead to inconsistent policy mix (2) Lowering cost by increasing risk would lead to greater fiscal space for fiscal authorities which in turn widens the scope for central bank to conduct a tight monetary policy (3) Increase in debt servicing may induce the fiscal authority to contract its policy to pay for the increased debt servicing. The study concluded that policy coordination ensures that policy is consistent and sustainable. It recommended, inter alia, that debt management should not be used to support monetary policy or poor fiscal policy. The study has its strength in its recognition of the desirability of coordination of fiscal and monetary policies for achieving inclusive growth. However, the study failed to devise a specific fiscal-monetary policy mix to enhance inclusive growth. The policy implication of findings is the need to devise a proper combination of fiscal and monetary policies to foster synergy between fiscal and monetary authorities and so ensure co-ordination of fiscal and monetary policies. Its relevance to the present study is its motivation

which has sustained the interest of the researchers.

Gali and Monacelli [3] carried out a study titled, 'Optimal monetary and fiscal policy in a currency union'. Study focused on the optimal fiscal-monetary policy mix being applied within European Monetary Union. The study employed a tractable framework for analysing fiscal and monetary policies within a currency union. Study revealed that the monetary authority determined a common interest rate for the unions leaving fiscal policy to be implemented at the country level. The study concluded that optimal monetary-fiscal policy mix in the presence of idiosyncratic shocks combined with the impossibility of resorting to nominal exchange rate adjustments to induce an inefficient response of the terms of trade that justifies the use of fiscal policy as a stabilization tool. The study recommended, *inter alia*, that governments should embark on variations in local government spending leaving the union's central bank with the responsibility of stabilizing the general price level. The strength of this study is its ability to define clearly the roles for fiscal and monetary authorities, while its weakness is the absence of optimal policy to minimize deviations from proper fiscal-monetary policy mix. However, it was considered relevant to the present study as it served to reinforce the motive for the study.

Franta, Libich and Stehlik [9] carried out a study titled, 'The big picture of monetary-fiscal interactions'. The study sought to ascertain whether or not fiscal stress spillover could cause monetary stress. Research focused on medium-long-term scenarios and outcomes using standard game-theoretic tools to gain insight into the degree of monetary-fiscal policy interactions. Two hypotheses tested include: (1) stronger monetary commitment leads to an improved monetary outcome such as low inflation rate (2) Stronger monetary commitment imposes financial discipline. Results of analysis had warranted the acceptance of these hypotheses. Therefore, the results indicate that: (1) Fiscal excesses may spill over to monetary policy (2) Monetary commitments might impose fiscal discipline on fiscal authorities. Policy implication of findings is the need for legislated commitment to a numerical inflation target. Study had injected the novelty of the application of the game-theory for establishing the critical path of monetary-fiscal policy interactions. It was considered relevant to the present study as it identified a part

of problem which the present study was intended to solve.

Canales-Krijenko [10] studied the impact of policy mix on economic growth and real exchange rate in South Africa. Study revolved around ascertaining whether or not tight fiscal, or looser monetary or greater reserve build up increases growth and depreciates rand in real terms. The study which covered 20 years employed econometric techniques including cross-section regressions, panel and South Africa-specific dynamic systems for the analysis of data. Results indicate that: (1) Higher public expenditure increased growth but the higher government revenue and debt required for funding tended to offset it (2) Debt-financing was more effective than tax financing for enhancing growth (3) Higher reserve in conjunction with lower real policy rate was more effective for enhancing growth. The study concluded that fiscal tightening contracts economic activity in the short run and has no clearly defined direction of transmission of impact on exchange rate. The study ended up as a partial analysis only as it failed to yield results on the impact of policy mix convergence on output and exchange rate. Notwithstanding, it was considered relevant to the present study as it served as a motivation to the researchers.

Bernanke [11] explored the role of central bank in inflationary and deflationary environments. He observed that central bank independence ensures the repudiation of the government policy of public borrowing and monetization of public debt during the period of inflation. He reported that under liquidity trap excessive borrowing would lead to increased money supply which in turn exacerbates the inflationary spiral in the economy. He had recommended proper co-ordination of monetary and fiscal policies for the attainment of macroeconomic stability. Policy implication of Bernanke's recommendation is the need for central banks in monetary union to take into cognizance the state of the monetary market of member countries while deciding on the monetary policy to be adopted within the monetary union. The elaborate treatment of policy mix in this study, stretching over several frontiers and periods, has placed a high premium on Bernanke's recommendations. His observations have provided the basis for the conduct and advancement of the present study which sought to devise a proper combination of fiscal and monetary policies that would ensure macroeconomic stability.

Bianchi [12] studied monetary-fiscal policy in the US with a view to determining the effectiveness of the policy mix for stabilizing the economy. The study estimated Dynamic Stochastic General Equilibrium model with variation in the monetary/fiscal policy mix and volatilities over time. Two independent Markov-switching processes were employed to model the change in monetary-fiscal policy mix and volatilities. Findings indicate that: (1) Monetary-fiscal policy mix evolved over time (2) Three policy mix regimes including active monetary/passive fiscal, active fiscal/passive monetary and active monetary/active fiscal were identifiable (3) Fiscal indiscipline during the era of passive monetary/active fiscal resulted to inflation in the 60s and 70s. Policy implication of findings is the need for government to maintain high fiscal discipline in order to enhance the effectiveness of macroeconomic policy mix for increasing output and reducing inflation. The strength of this study is in its dynamic equilibrium analysis that yielded three distinct monetary-fiscal policy regimes which described the prevailing situation of the US macro-economy. The relevance of this study to the present enquiry is its awareness of the need for greater effort in this area- the need which was sought to be satisfied in the present study.

Stawska [13] investigated the impact of monetary-fiscal policy mix on growth of investments in economic activity in euro area following global financial crisis. The study focused on determining the extent of co-operation between fiscal and monetary authorities in the face of the financial crisis. The study employed the statistical technique, including graphical method, for the analysis of data. Results indicate that: (1) There was a significant impact of fiscal-monetary policy mix on the level of government investments (2) Low interest rate was fixed by the ECB while applying nonstandard instruments of monetary policy (3) Fiscal policy was aimed at increasing public expenditure in order to stimulate investment for economic recovery. The study concluded that the financial crisis had facilitated a more appropriate fiscal-monetary policy mix for achieving a high rate of profitable investment in euro area. The strength of this study is in its recognition of investment as a medium of transmission of policy mix on economic activities. But the partial analysis of policy mix, devoid of determination of the conjoint impact of fiscal and monetary policies on investment, has undermined the importance of this study to the present study.

Tanimounei, Combes and Tapsoba [14] studied the impact of policy mix coherence on economic activity in ECOWAS. Four possible regimes of policy mix were considered in this study. Panel data, spanning across 1990-2006 were used for the study. Study employed panel Method of Fixed Effects with bootstrapped standard errors for the analysis of data. Results indicate that: (1) Monetary policy had a significant negative impact on economic growth (2) Fiscal policy had no significant impact on economic growth (3) External debt had a substantial positive impact on economic growth (4) Quality of institutions impacted positively on growth. Policy implication of findings is the need for governments of ECOWAS to exploit the prospect of an ECOWAS-wide common currency for their mutual benefits. Study suffered from lack of sustained focus on the implications of policy mix coherence for enhancing growth in ECOWAS. However, the study has reinforced efforts in the present study to device, in concrete term, a proper fiscal-monetary policy mix for achieving inclusive growth.

Philippopoulos, Varthalitis and Vassilatos [15] studied the optimal mix of monetary and fiscal policy actions in a New Keynesian model of a closed economy. The study focused on welfare ranking of differential fiscal policy instruments when interest rate could be determined by the central bank in accordance with Taylor's rule. Study was carried out in two policy environments- when policy aimed at stabilizing the economy against shocks and when policy aimed at resolving both shock stabilization and debt consolidation. Data on euro zone, obtained from OECD Economic Outlook spanned across 1995-2010. The model specified for the study was solved using Schmitt-Grohe and Uribe (2004) technique. Results indicate that: (1) Public spending, rather than tax, was more effective for shock stabilization and or debt consolidation (2) Monetary policy was effective for control of inflation while fiscal policy was suitable for reducing public debt (3) The effect of interaction between monetary and fiscal policies on output gap or general welfare was positive (4) Debt consolidation was more effective than non debt consolidation for promoting welfare (5) The choice of optimal policy mix depended on the desired response- price stabilization or public debt reduction. The strength of the study is its rare feat- delving into welfare comparison of all major tax-spending policy instruments in a unified framework. However, its treatment of alternative policy mix has not yielded a proper

combination of fiscal and monetary policies which would enhance growth. Notwithstanding, the findings have policy implication to fiscal and monetary authorities for co-operating to effectively co-ordinate macroeconomic policies.

Haralambie [16] examined the role of monetary policy within the context of the macroeconomic policy mix. The study covered the period, 2010-2014. It was essentially a qualitative study which sought to gain an insight into the use of instruments of monetary policy by the National Bank of Romania to ensure the overall balance and to maintain low inflation rate which is consistent with the adoption of single European currency. The study revealed that macroeconomic policy mix impacted on budgetary revenues, dynamics of the GDP and prices, taking into account the fiscal pressure. The study concluded that the effectiveness of monetary policy depends on the implementation of the objectives agreed with EU, IMF and WB. The policy implication of the finding is the need to co-ordinate fiscal and monetary policies in order to maintain low inflation rates and ensure price stability. The weakness of this study is the short period it covered, while its strength is its inclusion of budgetary policies in the analysis. The revealed preference for optimal policy mix in this study has provided the motivation to embark on the present enquiry.

Liu [17] undertook a study to identify factors responsible for China's adoption of opposing policy mix, alongside its characteristics and effects. It was essentially a qualitative study. Findings indicate the following: (1) The cause of opposing policy mix in China was the imbalance in its macro-economy which suffered from the pressures of inflation and slow growth (2) The major characteristic of the Chinese economy is the weak demand for money by the real economy (3) The effect of opposing policy mix adopted in China was short-term growth accompanied by high long-term cost. The policy implication of findings is the need for both developed and developing economies to consider diligently their basic characteristics before deciding on the alternative forms of fiscal-monetary policy mix to be employed. The strength of the study derives from the novelty it injected into economic literature with its discernible departure from the traditional policy mix alternatives commonly employed in Europe and America. Its relevance to the present study is its incentive to strive towards devising a proper

combination of fiscal and monetary measures of a dynamic policy mix.

Gammadigbe [18] carried out a study to determine policy mix coherence index (PMCI). The study spanned across 1990-2013. Sample comprised of 30 countries. The study focused on measuring the coherent index of policy mix expressed as the average number of periods that monetary and fiscal policies have been in phase in a Keynesian perspective. Study employed econometric tools of ordinary least square and robust least square to establish the nature of the relationship between the policy mix coherence and stabilization of economic activities. The finding indicates that there was an inverse relationship between good co-ordination of monetary and fiscal policies and output volatility. Study concluded that a coherent policy mix tends to promote economic stabilization thereby validating economic stabilization theories. Study exhibited weakness in its failure to provide theoretical constructs for constituting a proper fiscal-monetary policy mix conducive for growth. Despite this short coming, the quantification of coherent policy mix for economic stabilization has policy implication for governments to build an institutional framework for stabilization of economic activities. The determination of PMCI in this study has rendered it relevant to the present study by raising hopes for possible attainment of its avowed objective.

Cazacu [19] carried out a study to determine the effect of interaction between fiscal and monetary policies on the output gap and inflation in Romania. The study covered the period, 2000-2014. The study employed Structural Vector Autoregression (SVAR) model for the analysis of data. Results indicate that: (1) There was no significant effect of interaction between monetary and fiscal policies on economic activities in Romania (2) Monetary policy exercised more activities in Romania than did fiscal policy. Policy implication is the need for the fiscal and monetary authorities in Romania to strive towards maintaining a synergy for effective coordination of fiscal and monetary policies for sustainable growth. The weakness of the study is its inability to determine the conjoint effect of fiscal and monetary policies on economic activities. However, the study was considered relevant as its discernible lacuna provided a prior justification for the present study.

Coric, Simovic and Deskar-Skrbic [20] studied the impact of monetary-fiscal policy mix on

output and price stability. The study covered the period, 2004-2012. The study employed structural vector autoregression (VAR) technique for the analysis of data. Results indicate that: (1) Expansionary monetary-fiscal policies impacted positively on economic activities (2) Fiscal expansion enhanced nominal exchange rate application while monetary expansion resulted in nominal exchange rate depreciation. Policy implication of findings is the need for proper coordination of fiscal and monetary policies for enhancing growth. But the study yielded results which did not reflect the impact of proper coordination of fiscal and monetary policies for the achievement of this objective. To this end, therefore, this study had failed to determine the conjoint impact of policy mix on output in the economy. Howbeit, it was still considered useful to the conduct of the present study as it exposed the gap which the present study was intended to fill.

Palek [21] investigated the optimal policy mix in a currency union with a country-specific credit spread through the introduction of cost channel differential. Study assumed two-country model of a monetary union with a public sector in which government spending is financed either by lump-sum or distortionary taxes. Study employed the building blocks including the IS relation, the budget constraint and the Phillips curve for solving the joint policy problem of the monetary and fiscal authority. Results indicate that: (1) Monetary policy stabilizes the economy at union level while fiscal policy stabilizes national economies (2) In the presence of cost-channel, monetary policy becomes less effective and fiscal policy comes into action (3) The optimal policy mix is a function of the strength of the cost channel (4) Inflation and cost channel differentials boost fiscal policy in its stabilization role. Findings have policy implications for coordinating fiscal and monetary policies as commitment is more effective than a discretionary decision for achieving macroeconomic stability. The strength of this study is its clear insight into the relative importance of fiscal and monetary policies in a monetary union with distinct cost-channel. Nevertheless, its relevance to the present study was undermined by the weakness in its analytical framework which did not provide elaborate treatment of the effect of interaction between fiscal and monetary policies in the stabilization process.

Orphanides [22] embarked on a study to explain the frequent application of suboptimal policy mix

in euro area following the global financial crisis. Study had as its major objective the comparison between fiscal and monetary policies in the euro area and United States. It was essentially a qualitative study. Results indicate that: (1) Effectiveness of fiscal policy was impeded by institutional framework which had constrained individual states as it lacked instruments to influence the entire area (2) The effectiveness of European Central Bank (ECB) monetary policy was impaired by distributional effects of balance sheet policies and discretionary decisions (3) Fiscal and monetary policies were complicated when safe asset profile of euro area was compromised. The study concluded that changes in the discretionary decisions on the implementation of monetary policy have the potential to reduce the distributional effects and boost the policy mix. Policy implication of findings is the need for ECB to use its discretionary powers to provide suitable monetary accommodation and reduce distributional effects of prior discretionary decisions which have hampered the effectiveness of its monetary policy. The strength of this study derives from its recognition that institutional framework plays a central role in the stabilization of macroeconomic indicators. However, its usefulness for the present study was eroded by its failure to determine the interactive effect of combined fiscal and monetary policy measures on macroeconomic stability.

2.3 Summary of Review

The theoretical review revealed that most studies were based on models which accommodate the major implications of Keynes's MEC theory of business cycle. These models had yielded evidence of the strong positive effect of monetary-fiscal policy interaction on output gap and price stability, which are in conformity with the major implications of Keynes's MEC theory that proper monetary and fiscal policy mix is needed to increase MEC and enhance aggregate demand for economic recovery and sustainable growth. Thus, Keynes's MEC theory was effective for a detailed analysis of the effect of monetary-fiscal policy interactions on growth. This has provided a prior justification for the adoption of Keynes's MEC theory of business cycle for the conduct and advancement of the present study.

From the empirical review, it is obvious that monetary-fiscal policy mix remains a contentious issue which has aroused and sustained the interests of researchers and scholars over a wide

span of period. Review revealed that studies yielded mixed evidences for different forms of policy mix and different economies. Moreover, there was unanimity of agreement among researchers on their findings that monetary policy would prove effective for stabilizing output-gap and inflation only when a high level of fiscal discipline is maintained. Continuing search for optimal policy mix to-date is an indication that no conclusive evidence has emerged. This is because the search for optimal policy mix among four different policy alternatives including loose fiscal-easy money, loose fiscal-tight money, tight fiscal-easy money and tight fiscal-tight money is somewhat like a complex problem with no definite solution. These different forms of policy mix are not policy mix in the true sense of the word. At best, they could be termed as monetary-fiscal policy schedules. A proper monetary-fiscal policy mix was considered in this paper as a combination of exact proportions of monetary and fiscal variables which constitute a constellation of the monetary-fiscal policy mix.

From the foregoing, it is clear that the empirical review had raised more unsettled issues than it proffered solution to the problem of determining both the content and weights of monetary and fiscal variables in the constellation of the optimal policy mix. None of the reviewed studies had delved into the problem of determining the scope of optimal policy mix and the weights to be assigned to each of monetary and fiscal measures in the constellation of the optimal monetary-fiscal policy mix. This discernible lacuna was sought to be filled in the present study, i.e., determining the content and weights of monetary and fiscal variables in a constellation of elements of a proper monetary-fiscal policy mix. Therefore, resolving these unsettled issues is what has informed the need to embark on the present study.

3. METHODS

3.1 Research Design

Study has adopted case study design as Nigeria is typical case of developing economies. Study spanned across 1980-2016. This period coincides with the post oil-boom era during which the federal government pursued vigorously dynamic fiscal and monetary policies that would foster growth and stabilize the economy. Data were obtained from Central Bank of Nigeria, National Bureau of Statistics and World

Development Indicators. The choice of the relevant variables included in the analysis conformed to the postulates of Keynes's MEC theory of the trade cycle.

3.2 Empirical Model

This study sought to develop a proper fiscal-monetary policy mix through the identification of common and specific factors which are mixtures of fiscal and monetary policy instruments that could contribute maximally to growth. The study was based on Tanzi's [23] model which had recognized the fact that indicators, y_i can be influenced by changes in particular policy instruments, x_j . His model was in the form:

$$y_i = f(x_1, x_2, x_3, \dots, x_j)$$

Where y_i is a specific indicator
 $x_1, x_2, x_3, \dots, x_j$ are fiscal and non-fiscal policy instruments.

However, non-fiscal policy instruments were ignored in Tanzi's model. Thus, the modified version of Tanzi's model including both fiscal and monetary policy instruments adopted for the present study has been presented in the form:

$$GDP = f(PPT, CET, CIT, FCR, RXP, CXP, DDT, XDT, MSP, CPS, NLA, LQR, DPR, TBR, EXC, LDR)$$

Where GDP is gross domestic product, PPT is petroleum profit tax, CET is custom and exercise duties, CIT is company income tax, FCR is federally collected revenue, RXP is recurrent expenditure, CXP is capital expenditure, DDT is domestic debt, XDT is external debt, MSP is money supply, CPS is credit to private sector, NLA is net loans and advances, LQR is liquidity ratio, DPR is deposit rate, TBR is treasury bill rate, EXC is exchange rate, and LDR is lending rate.

3.3 Multicollinearity, Singularity and Interdependence among Variables

To determine the appropriateness of factor analysis for this study, it has become necessary to check for the absence of multicollinearity and singularity within the dataset and also to determine the degree of interdependence among the variables. Variables included in the study should be linearly related to each other when

there is the absence of multicollinearity and singularity within the dataset. Gorsuch [24] had stated that a determining factor is based on the premise that a linear relationship exists between the factors and the variables when correlations are computed. Besides, in considering the degree of interdependence among variables, intercorrelations which are less than 0.30 are usually considered too weak to be useful for performing factor analysis [25]. To verify the multicollinearity, singularity and interdependence within the dataset, the correlation matrix has been presented in Table 2.

Table 2 shows that intercorrelations were of zero order, thereby indicating the absence of singularity but not ruling out the presence of multicollinearity since 33 intercorrelations are equal to or greater than 0.9. However, with the Table 2 showing the computed Determinant of the correlation matrix (1.28E-025) being less than the criterion Determinant of 0.00001, the presence of multicollinearity was confirmed. Multicollinearity is necessary in factor analysis as variables must be highly correlated with some of the other variables in order to load significantly into factors [26]. As also seen in the table, 49 intercorrelations were less than 0.30 and hence considered to be weak. This has necessitated the application of Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity (Chi-square value) to validate factor analysis for the study. KMO value should be greater than 0.70 in order to confirm that the factors contain sufficient numbers of variables. Also, Chi-square (χ^2) value should be significant at 0.05 confidence interval to infer that the variables are sufficiently correlated [27].

Table 3 shows that the computed KMO=0.774 while the computed $\chi^2 = 1596.728$ ($p \leq 0.000$). Now, since the computed KMO is greater than the criterion KMO of 0.700, the factors were considered to contain sufficient numbers of variables. Again, considering the computed χ^2 value, since $p \leq 0.000$ is less than $p \leq 0.05$, the computed χ^2 value of 1596.728 was considered to be significant at 0.05 confidence interval. This clearly suggests that the variables included in the model were sufficiently correlated. Thus, the results of KMO and Bartlett's tests have confirmed the validity of factor analysis for application in the present study. Evidently, the presence of multicollinearity among the included variables is not likely to affect the results of factor analysis, thereby corroborating Field's [28] view that mild multicollinearity is not a problem for factor analysis.

3.4 Factor Model Specification

Common factor model was used in the present study. The choice of common factor model for this study finds a prior justification in the adoption of Tanzi's [23] model which expresses a linear functional relationship among $y_i, x_1, x_2, x_3, \dots, x_j$. The modified version of Tanzi's model has been presented in the form:

$$GDP = f(PPT, CET, CIT, FCR, RXP, CXP, DDT, XDT, MSP, CPS, NLA, LQR, DPR, TBR, EXC, LDR).$$

Common factor model is suitable when the variables are assumed to be a linear function of a set of latent variables [29,30]. The underlying assumption of the common factor model is that the variance is usually divided into common and unique components with the unique variance being further divided into specific and random error variance [31].

There are 17 variables- GDP (Dep), PPT, CET, CIT, FCR, RXP, CXP, DDT, XDT, MSP, CPS, NLA, LQR, DPR, TBR, EXC, and LDR. Factor analysis model require that the variables included in the analysis should be linearly related to each other. The factor model used for this study was developed by Cornish [27]. The model has been expressed algebraically in the form:

$$X_i = \alpha_{i1}F_1 + \alpha_{i2}F_2 + \dots + \alpha_{im}F_m + e_i$$

Suppose there are p variables X_1, X_2, \dots, X_p measured on a sample of n subjects, variable i is a linear combination of m factors F_1, F_2, \dots, F_m and $m < p$, where α_{is} are the factor loadings for variable i and e_i is that part of variable x_i that cannot be explained by the factors.

Since there are 17 variables, the rule of thumb requires that only one-third of the total number of variables could be extracted as factors. Therefore, the factor analysis model has been expressed in the form:

$$GDP = \alpha_{i1}F_1 + \alpha_{i2}F_2 + \alpha_{i3}F_3 + \alpha_{i4}F_4 + \alpha_{i5}F_5 + \alpha_{i6}F_6 + e_i$$

Where

α_{i1} is the factor loading of Factor 1
 α_{i2} is the factor loading of Factor 2
 α_{i3} is the factor loading of Factor 3
 α_{i4} is the factor loading of Factor 4
 α_{i5} is the factor loading of Factor 5
 α_{i6} is the factor loading of Factor 6

e_i is the part of dependent variable GDP that cannot be explained by that factor.

3.5 Eigenvalues for Determination of Number of Factors

Cornish [27] had suggested that to determine the number of factors to be extracted, say m , the number of eigenvalues should be greater than 1. The eigenvalues have been presented in Table 4.

As can be seen in Table 4, only three factors had eigenvalues greater than 1. Thus, three factors were extracted since $m=3$.

3.6 Evaluation Criteria

Study employed factor analysis technique for analyzing the data. The main focus of factor analysis was to constitute factor structure of fiscal-monetary policy mix for inclusive growth in developing economies. Principal axes method was used for factorizing the correlation matrix of GDP, fiscal and monetary variables. The conservative rule of thumb is that decision should not be made on the significance of unrotated factor loading [32]. Thus, accordingly, Varimax rotation of the matrix was carried out.

By rotating the factors slightly in a clockwise direction, the strength of the relationship between the factors and the variables clustered near each other was increased [33,34]. Rotation improves the meaningfulness, reliability and reproducibility of factors [30,35]. Results of factor analysis were interpreted on the basis of new values of factor loadings obtained through Varimax rotation. Only factor loadings which are equal to or greater than ± 0.400 were considered to be significant. Ford et al. [30] had suggested the inclusion of factor loading >0.400 . Factor loadings of the criterion (dependent) variable were provided for all factors disregarding the level of significance in order to ascertain whether or not the factors represented correlates of GDP. The process of factor extraction was discontinued when the number of factors equaled three which is the result obtained when the number of eigenvalues (m) greater than 1 was found to be 3 [27]. Extracting too many factors may present undesirable error variance but extracting too few factors might leave out valuable common variances [36].

4. RESULTS

The results of data analysis were presented in the tables in order to facilitate interpretations. Interpretation of results has been presented under the following sub-heading:

- Factor structure of growth, fiscal and monetary variables interrelationship
- Varimax (rotated) factor structure of growth, fiscal and monetary variables interrelationship
- Factors linking growth to fiscal and monetary variables.

4.1 Factor Structure of Growth, Fiscal and Monetary Variables Interrelationship

The factor structure of growth, fiscal and monetary variables interrelationship has been presented in Tables 5 and 6 to facilitate extraction of factors lying concealed in the interrelationship among dependent variable and independent variables.

Table 5 shows the original principal component factor matrix. The last column reveals the communalities (h^2). Along the rows, number of variables and Kaiser's criterion were entered at the end of the table. As it is clearly evident in the table, factor analysis yielded three factors. The extraction of three factors was considered to be accurate since all the communalities are greater than Kaiser's criterion. Kaiser's criterion requires that when the number of variables is less than 30, the communalities should exceed 0.700 for extraction to be considered to be accurate [28].

4.2 Varimax (Rotated) Factor Structure of Growth, Fiscal and Monetary Variables Interrelationship

Table 6 shows the Varimax factor loadings along with communalities and uniqueness of variables. The total variance of any variable comprises of common variance (h^2) as well as specific and error variance. Since it is usually difficult to separate specific variance and error variance, both are conveniently combined and denoted by unique variance (u^2). This has been entered into the last column of this table. At the end of each column of the factor, the eigenvalues, i.e., percentages of total variance and common variance contributed by the factor were inserted.

4.3 Factors Linking Growth to Fiscal and Monetary Variables

To identify Factors 1, 2, and 3 which have crystallized from data analysis, Table 6 was split further into three sub-tables---Tables 6.1, 6.2, and 6.3 to facilitate discussion on the significant factor loading of each of the rotated factors.

Factor 1: As explained earlier, the Varimax rotation of the original factor structure of growth, fiscal and monetary variables interrelationship was carried out. The resulting Varimax rotated version was presented in Table 6.1 in descending order.

Table 6.1 shows that the dependent variable, GDP was clustered with the dimensions of CIT, RXP, MSP, DDT, CPS, CET, NLA, EXC, FCR, CXP, and PPT in descending order. Factor 1 represented mainly different instruments of fiscal policy with GDP on the one hand and different instruments of monetary policy with GDP on the other hand. These results suggest that certain common elements were shared by variables of fiscal policy with GDP on the one hand and elements of variables of monetary policy with GDP on the other so as to account for a common factor. Based on the significant loadings on fiscal and monetary variables, this factor can be aptly identified as expansionary fiscal-expansionary money.

The constellations of instruments of fiscal policy and the instruments of monetary policy with GDP paved the way for considering the various instruments of fiscal-monetary policies as plausible correlates of GDP. Positive loadings on both fiscal and monetary variables in conjunction with positive loading on GDP indicate that expansionary fiscal-expansionary money is optimal policy mix.

Expansionary fiscal-expansionary money had accounted for the common factor variance to the extent of 63.86 per cent which is also 63.86 per cent of the total variance in GDP contributed by the three factors.

Both fiscal and monetary variables have combined in the specific constellation to form Factor 1 (expansionary fiscal- expansionary money). Constellations of fiscal variable of the policy mix with very high factor loadings are CIT (0.988), RXP (0.984), DDT (0.977), CET (0.953), FCR (0.883), CXP (0.848) and PPT (0.846) while those of monetary variables with very high factor loadings are MSP (0.983), CPS (0.973), NLA (0.929) and EXC (0.901). Thus, both fiscal and monetary variables were considered to be strong predictors of expansionary fiscal-expansionary money. Kline [34] had asserted that factor loadings are same as regression weight. This implies that fiscal policy and monetary policy are complementary in the formulation and effective implementation of macroeconomic policy for inclusive growth.

Factor 2: Significant loadings on Factor 2 have been presented in descending order in Table 6.2 to facilitate discussion of results.

As can be seen in Table 6.2, Factor 2 had very high loadings on LDR (0.952), TBR (0.887), DPR (0.877) and moderate loading on XDT (0.413). The three variables with very high loadings are monetary variables while the variable with moderate loading is fiscal variable. Positive significant loadings on LDR, TBR and DPR suggest that as Factor 2 rises LDR, TBR and DPR also rise and vice versa, thereby depicting a constriction in money supply. Positive significant loading on XDT is implicit in contractionary fiscal policy. Debt is usually incurred at high-interest rate which discourages investment, thereby, eroding MEC. Hence, Factor 2 could be nothing other than contractionary fiscal-contractionary money. Negative nonsignificant loading on GDP implies that contractionary fiscal-contractionary money was not optimal policy mix as it tended toward impeding growth.

The common factor variance accounted for by Factor 2 i.e., contractionary fiscal-contractionary money was 16.41 per cent which is 16.41 per cent of the total variance contributed by the three factors.

Factor 3: Table 6.3 shows that Factor 3 was highly loaded on LQR (0.859) but moderately on XDT (0.687). This factor could not be identified since it was loaded significantly on only two variables with r between LQR and XDT ≈ 0.30 which is less than 0.70. Tabachnick and Fidell [25] had stated, inter alia, that a factor with two variables is only considered reliable if the variables are highly correlated ($r > 0.70$). However, positive high significant loading on LQR implies that the pseudo factor could be interpreted with extreme caution to be liquidity preference (demand for money). Positive significant loading on XDT and positive, nonsignificant loading on GDP (0.034) imply that rising demand for money induced external borrowing which tended toward increasing GDP.

The common factor variance accounted for by this pseudo factor was 7.99 per cent which is 7.99 per cent of the total variance explained by the three. The magnitude and direction of the contribution of demand for money to growth create the need for frequent review of liquidity ratio by monetary authorities.

On the whole Factors 1, 2, and 3 had explained the variance in GDP up to 88.26 per cent leaving

out only 11.74 per cent of the unexplained variance. Rietveld and Van Hont [37] and Field [38] had recommended the acceptance of factors which account for 70-80 per cent of the total variance as satisfactory.

4.4 Diagrammatic Representation of Factors

For at a glance appreciation, the factors have been presented diagrammatically in Figs. 1, 2, and 3.

4.5 Modal Summary

The results of factor analysis have been summarized in the following equation:

$$GDP = 0.986EF-EM - 0.058CF-CM + 0.034DMM$$

Where EF-EM is expansionary fiscal-expansionary money; CF-CM is contractionary

fiscal-contractionary money and Pseudo Factor (DMM is demand for money).

4.6 Summary of Major Findings

Major findings which crystallized from this study include the following:

1. The optimal policy mix which was compatible with inclusive growth is expansionary fiscal-expansionary money which blended CIT, RXP, MSP, DDT, CPS, CET, NLA, EXC, FCR, CXP and PPT in the exact proportion of their respective regression weights.
2. Contractionary fiscal-contractionary money with components of LDR, TBR, DPR and XDT was not optimal policy mix as it tended toward impeding growth.
3. Rising demand for money induced external borrowing which only tended toward increasing GDP.

Table 1. Mixture of tax, federal government expenditures and money supply in Nigeria for the period, 2007-2016

Year	Value added tax (bN)	Total expenditure (bN)	Money supply (bN)	Lending rate (%)	Treasury bill rate (%)	Unemployment rate (%)	Inflation rate (%)
2007	144.37	2450.90	5127.40	16.94	6.91	7.60	5.40
2008	198.07	3240.82	8008.20	15.48	5.00	7.60	11.60
2009	229.32	3452.99	9411.11	18.36	3.72	7.60	11.50
2010	275.57	4194.58	11034.94	17.59	5.60	7.60	13.71
2011	318.00	4712.06	12172.49	16.02	11.16	7.60	10.80
2012	347.69	4605.39	13895.39	16.79	13.60	7.50	12.20
2013	389.53	5185.32	15160.29	16.72	10.42	7.50	8.50
2014	388.85	4587.39	17679.29	16.55	11.95	7.50	8.10
2015	381.27	4988.86	18901.30	16.85	8.95	10.60	9.00
2016	397.06	5160.74	21607.68	16.87	11.56	13.40	11.98

Source: Central Bank of Nigeria Statistical Bulletin, World Development Indicators

Table 2. Correlation matrix (17x17) among GDP (dep.) and independent variables

S/N	Code	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	GDP	X																
2	PPT	.766	X															
3	CET	.906	.962	X														
4	CIT	.971	.890	.972	X													
5	FCR	.933	.574	.752	.864	X												
6	RXP	.988	.791	.917	.980	.923	X											
7	CXP	.901	.487	.688	.807	.904	.877	X										
8	DDT	.944	.920	.982	.991	.816	.963	.755	X									
9	XDT	.324	.271	.368	.275	.234	.289	.241	.304	X								
10	MSP	.962	.882	.961	.995	.851	.979	.805	.989	.230	X							
11	CPS	.945	.896	.962	.989	.828	.967	.783	.988	.209	.997	X						
12	NLA	.948	.699	.840	.913	.901	.932	.896	.863	.229	.909	.887	X					
13	LQR	-.127	-.079	-.074	-.113	-.018	-.107	-.053	-.114	.267	-.157	-.156	-.117	X				
14	DPR	-.354	-.327	-.354	-.410	-.404	-.415	-.332	-.402	.157	-.412	-.407	-.343	-.103	X			
15	TBR	-.242	-.065	-.143	-.238	-.291	-.264	-.352	-.178	.246	-.247	-.231	-.347	-.007	.760	X		
16	EXC	.914	.658	.826	.862	.835	.893	.848	.845	.618	.837	.807	.842	.036	-.248	-.176	X	
17	LDR	.016	-.084	-.043	-.073	-.057	-.053	.021	-.052	.373	-.087	-.094	-.057	-.137	.817	.784	.132	X

NB: All figures were rounded to three places of decimal

Table 3. Results of KMO and Bartlett's test

Kaiser-Meyer-Olkin measure of sampling adequacy	.774
Bartlett's test of sphericity approx. Chi-square	1596.728
df	136
Sig.	.000

Table 4. Eigenvalues for determination of number of factors

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	11.046	64.978	64.978	11.046	64.978	64.978
2	2.653	15.606	80.584	2.653	15.606	80.584
3	1.304	7.670	88.254	1.304	7.670	88.254
4	.950	5.589	93.843			
5	.539	3.172	97.015			
6	.223	1.311	98.326			
7	.113	.664	98.990			
8	.058	.344	99.334			
9	.052	.308	99.642			
10	.027	.158	99.800			
11	.023	.136	99.936			
12	.006	.034	99.970			
13	.003	.017	99.988			
14	.001	.006	99.994			
15	.001	.004	99.997			
16	.000	.002	99.999			
17	.000	.001	100.000			

Extraction method: Principal Component Analysis

Table 5. Principal axes (original) factor structure of growth, fiscal and monetary variables interrelationships (N=37)

S/N	Variables codes	Factor 1	Factor 2	Factor 3	h ²
1	GDP	.985	.078	-.025	.978
2	PPT	.838	.077	-.097	.718
3	CET	.949	.098	-.021	.911
4	CIT	.992	.022	-.061	.988
5	FCR	.900	-.025	.065	.816
6	RXP	.991	.020	-.025	.983
7	CXP	.861	.001	.060	.746
8	DDT	.976	.057	-.064	.959
9	XDT	.316	.554	.595	.761
10	MSP	.986	.003	-.115	.985
11	CPS	.975	.000	-.132	.967
12	NLA	.938	-.013	-.041	.882
13	LQR	-.089	-.058	.883	.791
14	DPR	-.438	.809	-.159	.872
15	TBR	-.293	.849	-.100	.816
16	EXC	.898	.227	.252	.922
17	LDR	-.087	.943	-.111	.909
No. Of variables				17	
Kaiser's criterion				>.700	

NB: Factor loadings were rounded to three decimal places

Table 6. Varimax (rotated) factor structure of growth, fiscal and monetary variables interrelationships (N=37)

S/N	Variable codes	Factor 1	Factor 2	Factor 3	h ²	u=(1-h ²)
1	GDP	.986	-.058	.034	.978	.022
2	PPT	.846	-.028	-.043	.718	.282
3	CET	.953	-.034	.040	.911	.089
4	CIT	.988	-.108	-.010	.988	.012

S/N	Variable codes	Factor 1	Factor 2	Factor 3	h ²	u=(1-h ²)
5	FCR	.883	-.160	.104	.816	.184
6	RXP	.984	-.116	.026	.983	.017
7	CXP	.848	-.128	.101	.746	.254
8	DDT	.977	-.071	-.008	.959	.041
9	XDT	.344	.413	.687	.761	.239
10	MSP	.983	-.119	-.066	.985	.015
11	CPS	.973	-.117	-.084	.967	.033
12	NLA	.929	-.138	.003	.882	.118
13	LQR	-.156	-.171	.859	.791	.209
14	DPR	-.316	.877	-.055	.872	.128
15	TBR	-.171	.887	.016	.816	.184
16	EXC	.901	.060	.326	.922	.078
17	LDR	.045	.952	.030	.909	.091
Sum of squares		10.856	2.789	1.358		
% of total variance		63.860	16.408	7.985		
% of common variance		63.860	16.408	7.985		

Table 6.1 Varimax Factor 1

S/N	Description of variables	Codes	Factor loading
4	Company income tax	CIT	.988
6	Recurrent expenditure	RXP	.984
10	Money supply	MSP	.983
8	Domestic debt	DDT	.977
11	Credit to private sector	CPS	.973
3	Custom and exercise duties	CET	.953
12	Net loans and advances	NLA	.929
16	Exchange rate	EXC	.901
5	Federally collected revenue	FCR	.883
7	Capital expenditure	CXP	.848
2	Petroleum profit tax	PPT	.846
1	Gross domestic product	GDP(Dep.)	.986

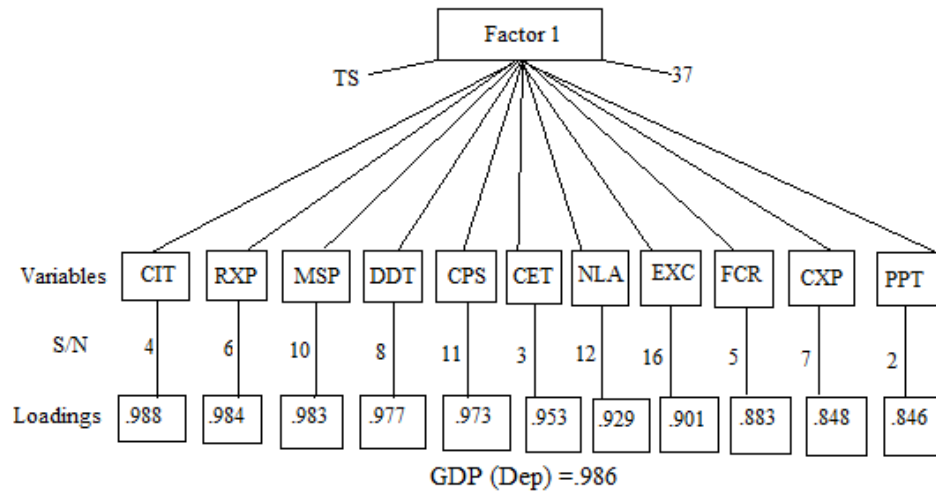


Figure 1. Factor 1: Expansionary fiscal-expansionary money

Table 6.2 Varimax Factor 2

S/N	Description of variables	Codes	Factor loading
17	Lending rate	LDR	.952
15	Treasury bill rate	TBR	.887
14	Deposit rate	DPR	.877
9	External debt	XDT	.413
1	Gross domestic debt	GDP (Dep.)	-.058

Table 6.3 Varimax Factor 3

S/N	Description of variables	Codes	Factor loading
13	Liquidity ratio	LQR	.859
9	External debt	XDT	.687
1	Gross domestic product	GDP (Dep.)	.034

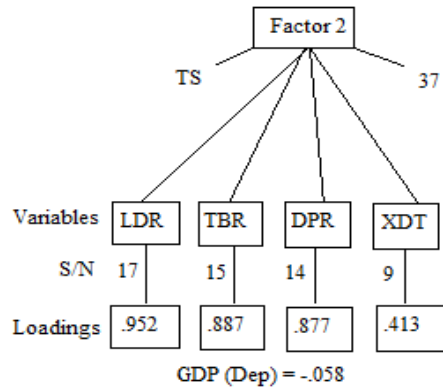


Figure 2. Factor 2: Contractionary fiscal-contractionary money

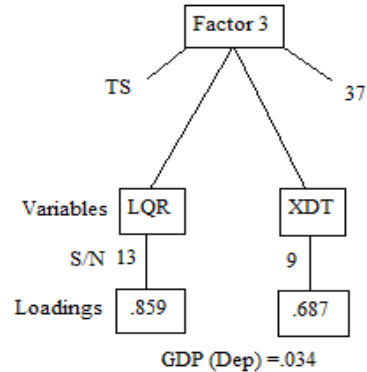


Figure 3. Factor 3: Pseudo factor (Demand for money)

5. DISCUSSION OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion of Findings

The optimal policy mix which was compatible with inclusive growth is expansionary fiscal-expansionary money which blended CIT, RXP, MSP, DDT, CPS, CET, NLA, EXC, FCR, CXP and PPT in the exact proportion of their respective regression weights. Indeed, a perfect blend of these fiscal and monetary measures is all that is needed for combating the chronic ill of financial system instability which often manifests in the twin evils of inflation and recession in most economies. Fighting inflation and recession would require effective co-ordination of both fiscal and monetary policies which in turn depends on the extent of synergy between fiscal and monetary authorities. Thus, a concerted effort by ministries of finance and central banks is what is required to manipulate the active fiscal and monetary variables in the policy mix for achieving inclusive growth. Certainly, a disconnection between fiscal and monetary authorities would negate all genuine effort toward devising viable macroeconomic policy mix which could steer the developing economies to the path of inclusive growth. Ostensibly, enforcement of working partnership between fiscal and monetary authorities would erode the much-sought-after central banks autonomy or independence.

However, the stark reality remains that no nation which sacrifices efficiency at the altar of glory can ever hope to achieve economic progress. After all, the worth of any institution is judged not simply by its stature but by its capacity to achieve the goals for which it is set up. This is, perhaps, a repudiation of the growing lust after apex bank independence in Britain and United States which is often exhibited by developing countries with conspicuous undeveloped financial systems. The expansionary fiscal-expansionary money unveiled in this study conforms to the loose fiscal-easy money identified by Brimmer and Sinai [1]. Besides, similar findings were reported by Bianchi [12] and Coric et al. [20]. Bianchi had identified active fiscal-active monetary as an optimal policy mix. Also, Coric et al. in their study had reported that expansionary monetary-expansionary fiscal impacted positively on economic activities.

Contractionary fiscal-contractionary money with components of LDR, TBR, DPR and XDT was not optimal policy mix as it tended toward impeding growth. This policy mix is simply an archetype of policy inconsistency arising from lack of proper co-ordination of fiscal and monetary policies. This occurs frequently during periods of stagflation when fiscal policy is focused on recession control while monetary policy is aimed at inflation reduction. It is a reflection of the conflict between fiscal and

monetary policies due to lack of synergy between fiscal and monetary authorities. Obviously, this policy contradiction counteracts to erode MEC through a restriction in money supply with accompanying paucity of investible fund and a hike in the cost of domestic and external debt. Unless the monetary authority restricts their role to active monitoring and control of monetary variables in order to bring monetary policy rate in harmony with the fiscal variables, their obsession with the power of autonomy might develop into cancerous cells which will sooner or later destroy the entire macro-economy. Therefore, it is only a logical deduction that the monetary authorities temper autonomy with collaboration in order to save the entire financial system. In other words, no monetary policy that is not synchronized into an optimal policy mix can ever be expected to impact positively on economic growth. Togo [8] articulated his views on the consequences of uncoordinated fiscal and monetary policies when he stated, *inter alia*, that weak debt management without a separate policy goal could lead to inconsistent policy mix.

Rising demand for money induced external borrowing which only tended toward increasing GDP. This is clearly the outcome of financing budget deficit to fight stagflation when macroeconomic policy mix exhibits contradiction between fiscal and monetary policies. It is only a rational expectation that deficit financing with rising external debt and falling money supply would counteract to erode the marginal efficiency of external debt. This is because raising liquidity ratio is a double-action monetary policy which impacts directly on demand for money and indirectly on money supply. The direct impact of the rise in liquidity ratio was to make more money available to the banks to meet the customers need for withdrawal thereby increasing the demand for money. The indirect effect of the rise in liquidity ratio was to reduce the volume of money available to the banks to expand credit, thereby constricting money supply. It is a reasonable proposition that the direct effect of raising liquidity ratio is usually stronger than the indirect effect. Expectedly, therefore, the more powerful demand for money offsets the increase in money supply to augment the less marginally efficient capital of external debt slightly to tend toward enhancing growth; less than adequate to impact on growth significantly. Certainly, this constitutes an addition to knowledge since there is a dearth of findings in the area of the performance index of liquidity ratio vis-à-vis external debt and growth.

5.2 Conclusion

It can be safely concluded that optimal policy mix for inclusive growth is a blend of company income tax, recurrent expenditure, money supply, domestic debt, credit to private sector, custom and exercise duties, net loans and advances, exchange rate, federally collected revenue, capital expenditure and petroleum profit tax in the exact proportion of their respective regression weights. As was previously highlighted this policy mix was comprised of constellations of fiscal and monetary measures which have put on it the garb of expansionary fiscal-expansionary money that impacted on growth significantly. Of particular interest is the emergence of a decelerator policy mix, contractionary fiscal-contractionary money which interacted with the optimal policy mix to raise the demand for money that was ultimately satisfied through public borrowing that failed to contribute significantly to growth. Debt which was incurred at high-interest rate to meet rising demand for money failed to contribute significantly to growth due to its declining MEC. It is the entry of Keynes's MEC theory into the analysis through this channel which has validated its use for the present study. Therefore, it is necessary to take cognizance of the implication of Keynes's MEC theory for enhancing the efficacy of optimal policy mix. What is of paramount importance is that both the fiscal and monetary authorities remain wholly committed to the rigorous implementation of the optimal policy mix in order to ensure a sustained harmony between fiscal and monetary policies that would eventually mitigate the harmful effect of the decelerator policy mix. It is perhaps the excavation of a financial system with exploratory factor analysis to extract the decelerator policy mix which is the novelty injected into economic literature by this study which has as its major contribution the quantitative description of what constitutes optimal policy mix. However, this is not to claim that it was a flawless process since the generalizability of the findings could be limited by the choice of Nigeria as a case study. In spite of this limitation, there is no gainsaying that the effectiveness of macroeconomic policy would be enhanced with the implementation of the recommendations proffered in the next section.

5.3 Recommendations

Based on the findings and the accompanying discussion, the researchers have made the following recommendations:

1. With the blend of fiscal and monetary variables in macroeconomic policy mix that contributed significantly to growth, it is expedient to constitute Macro-Economic Policy Committees (MEPC) identical to the Monetary Policy Committees (MPC) of apex banks, to be domiciled in ministries of finance, for proper coordination of fiscal and monetary policies for the attainment of macroeconomic goals.
2. The nonsignificant contribution of contractionary fiscal-contractionary money to growth which is the consequence of disharmony between it and the optimal policy mix requires that apex banks engage in periodic monitoring, control and regulation of operations of the banks to prevent the emergence of decelerator policy mix.
3. Rising demand for money which was met through external borrowing did not contribute significantly to growth due to the indirect action of rising liquidity ratio which depleted the MEC of external debt. Therefore, there is a need to resort to a limited application of liquidity ratio as an instrument for control of aggregate monetary resources within the banking industry.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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