بسم الله الرحمن الرحيم

The Republic of the Sudan

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**FACULTY OF GRADUATE STUDIES
& SCIENTIFIC RESEARCH**

THE IMPACT OF MONETARY POLICY ON SOME MACROECONOMIC VARIABLES IN SUDAN 1997 – 2015

Research for PhD Degree in Economics

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DEDICATION

TO THE SOUL OF MY LOVED

PARENTS AND SALIM ,

MAY THEY REST IN PEACE.

TO MY FAMILY ...

THANKS FOR YOUR ENCOURAGEMENT,

HELP AND SUPPORT IN ALL MY LIFE.

Researcher

ACKNOWLEDGEMENTS

ABSTRACT

This study dealt with the impact of monetary policy on some macro-economic variables in the Sudan during the period 1997 – 2015. The objectives of the study aimed to verify the impact of monetary policy on money supply, inflation rate, gross domestic product, balance of payments and unemployment rate. The study hypothesized that there is a significance statistical relationship between money supply and inflation rate, gross domestic product (GDP), balance of payments and unemployment rate. For testing the hypotheses, the study adopted two analytical methodologies. The descriptive analytical method and the Statistical Package of Social Sciences (SPSS), the study chose the ordinary least square model by using the Statistical Package of Social Sciences (SPSS). The models used money supply as independent variable, the inflation rate, gross domestic product, balance of payments and unemployment rate as dependent variables. The most important results of the study were: The relationship between money supply and inflation rate and balance of payments was an inverse relation. The relationship between money supply and GDP and unemployment rate was a proportional relation. There is fluctuation in gross domestic product growth rate. Also, the balance of payments showed deficit during the period of the study. The most important recommendations of the study were: activation of the role of the Central Bank of Sudan in controlling money supply using all tools simultaneously to assure their effectiveness. Decrease the balance of payments deficit by encouraging the exports sector. Achieving of national economic growth by maintaining price stability and the achievement of external and internal balance. Developing infrastructure in communications, storage, and transportation, besides, realizing economic and political stability as well as keeping security to attract foreign investments.

المستخلص

تناولت هذه الدراسة أثر السياسة النقدية على بعض المتغيرات الاقتصادية الكلية في السودان في الفترة ١٩٩٧ – ٢٠١٥ م . هدفت الدراسة إلى توضيح أثر السياسة النقدية على الاقتصاد السوداني وكذلك أثر عرض النقود على معدل التضخم ، معدل البطالة ، الناتج المحلي الاجمالي وميزان المدفوعات. تضمنت فرضيات الدراسة أن هناك علاقة ذات دلالة احصائية بين عرض النقود والناتج المحلي الاجمالي وميزان المدفوعات ومعدل البطالة ومعدل التضخم.اتخذت الدراسة طريقتين لتحليل المعلومات. طريقة الوصف التحليلي وبرنامج الحزم الاحصائية للعلوم الاجتماعية (SPSS) . تم اختيار نموذج المربعات الصغرى العادية باستخدام الحزم الاحصائية للعلوم الاجتماعية (SPSS) . استخدم النموذج عرض النقود كمتغير مستقل. والتضخم والناتج المحلي الاجمالي وميزان المدفوعات ومعدل البطالة كمتغيرات تابعة. توصلت الدراسة إلى أن العلاقة بين عرض النقود ومعدل التضخم و ميزان المدفوعات علاقة عكسية. وأن العلاقة بين عرض النقود والناتج المحلي الأجمالي ومعدل البطالة علاقة طردية . وأن هناك تذبذب في معدل نمو الناتج المحلي الاجمالي. وأن هناك عجز في ميزان المدفوعات. وقد أوصت الدراسة بتفعيل دور بنك السودان المركزي لضبط عرض النقود باستخدام آليات ضبط عرض النقود متزامنة مع بعضها البعض لزيادة فعاليتها. الحفاظ على نمو الاقتصاد القومي بالحفاظ على استقرار الأسعار وتحقيق التوازن الداخلي والخارجي. خفض العجز في ميزان المدفوعات بتشجيع قطاع الصادرات للحفاظ على الميزان الخارجي. الاهتمام بالبيئة التحتية بجانب الاستقرار الاقتصادي والسياسي والأمني لجذب الاستثمار الخارجي.

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LIST OF ABBREVIATIONS

GDP	Gross Domestic Product
LRAS	Long-Run Aggregate Supply
SRAS	Short-Run Aggregate Supply
AD	Aggregate Demand
AS	Aggregate Supply
NI	National Income
GNP	Gross National Product
NNI	Net National Income
GNI	Gross National Income
PI	Personal Income
DI	Disposable Personal Income
CPI	Consumer Price Index
LOLR	Lender of Last Resort
ATMs	Automatic Transfer Machines
CPA	Comprehensive Peace Agreement
OECD	Organization of Economic Cooperation and Development
MS	Money Supply
OLS	Ordinary Least Square
MD	Money Demand
B.C	Before Christian

GENERAL FRAMEWORK

GENERAL FRAMEWORK

(I) Introduction:

Macroeconomic policy is a group of economic policies that consists of economic program. The economic program contains a bundle of macroeconomic goals. The general frame of macroeconomic policy consists of:

- Fiscal policy
- Monetary policy
- Foreign trade policies and balance of payments
- Investment policy
- Stabilization and structural adjustment

The importance of monetary policy comes from the fact that it determines how economic balance among different economic sectors is achieved. In the frame of comprehensive development planning, monetary and fiscal policies play an important role in Sudanese economy.

Monetary policy is one of the vital measures, through which the authorities are able to affect the aggregate money supply in the economy. Moreover, the demand for money is one of the important functions in the structural adjustment program, and stabilization policies, which aim to coordinate between supply of money and demand for money through controlling the monetary functions, to achieve the macroeconomic policy objectives which are:

- To stabilize the internal price level.
- To stabilize the exchange rate and local currency.
- To control business cycles.
- To meet business needs.
- To maintain growth with high level of sustainable real output.

Monetary policy and banking system have a large effect on the different economic activities in any country. In any society, the main aim for decision makers is to attain the equilibrium in financial and monetary policies in the national economy. These goals are to achieve full employment, price settlement, balance of budgets and to reach a stable rate of economic growth. To achieve these goals, the balance must be realized between the flow of money and flow of goods. The flow of money represents the quantities of payments that are available and necessary for economic activities of national economy. The flow of goods represents the actual material side of economic activities that stand for total supply. This determines the economic equilibrium that leads to high level of labor and relative price settlement. This price settlement is an important goal for development planning in developing countries.

The monetary system consists of a number of rules that can be adopted by any country specially, the rules of money release (external and internal money). Also monetary policies must be applied in a certain time. The monetary system consists of:

- Monetary rules.
- Monetary policies.

Monetary rules are the backbone of monetary system that can determine the value of money. So that, they are the actual material expression of money unit.

Monetary policies are the cluster of rules that the monetary authority applies to ensure rapid and easy circulation of money, so as to perform its economic functions.

The change in money value or prices must always be increased and rarely decrease but never stay constant. This change in prices and money value is

organized by many phenomena that have many reasons to change the actual economic relations. This change in economic relations affects national economy. The result is the creation of a new equilibrium in economics. Example of these phenomena are inflation and unemployment.

Inflation can be defined as an increase in the quantity of money that lead to increase in prices. Inflation appears as an increase in money supply or enlargement in creation of credit as money demand (monetary expenditure). Inflation occurs when increase in quantity of goods and services is not suitable with the increase in the volume of payment tools. There are many definitions of inflation, but this definition indicates that quantity of money is the strategic variable which determine the general level of prices.

Unemployment is another phenomena occurs when an economy performs poorly, it imposes cost on individuals and society. Unemployed are those individuals who do not currently have a job but who are actively looking for work. Labor costs are responsible for about three fourths of production costs and labor income is the most important source of income. Labor market affect wages and employment.

Problems of the Research:

The problem is shown by uncontrollable inflation rate in Sudan .Inability of monetary tools to cover the requirements of development .The enlargement in issuing money to finance the deficit in the general budget. Problems related to money supply. Also, the unemployment and its impact .

Importance of the Research:

Monetary policy importance comes from the fact that it determines how economic balance among different economic sectors is achieved .Also, monetary policy is a vital measure through which the authorities are able to affect aggregate money supply. Monetary policy has a great effect on different economic activities in any country.

I chose this topic to know more about monetary policy ,its tools and when they can be applied .Moreover , to know the relationship between different macro-economic variables and the economy as a whole.

Research Questions:

- What are monetary policies suitable for Sudanese economy?
- How macroeconomic variables affect each other?
- How monetary policy affects inflation?
- How monetary policy affects the gross domestic product (GDP) ?
- How monetary policy affects balance of payments ?
- How monetary policy affects unemployment rate ?

Objectives of the Research:

The objectives of this research were:
- To study the impact of monetary policy on the Sudanese economy.
- To investigate the effect of inflation on the Gross Domestic Product (GDP).
- To explore the reasons of adopting these monetary policies in Sudan.
- To pinpoint the current monetary policies in Sudan during the period of study.

Research Hypotheses:

- There is a significant statistical relationship between monetary policy (in term of money supply) and balance of payments.

- There is a significant statistical relationship between monetary policy (in term of money supply) and gross domestic product(GDP).

- There is a significant statistical relationship between monetary policy(in term of money supply) and inflation rate.

- There is a significant statistical relationship between monetary policy (in term of money supply) and unemployment rate.

Research Methodology:

The study adopted two research methodologies:

- The descriptive analytical methodology.
- Statistical Package of Social Sciences (SPSS).

Research Organization:

This study consists of five chapters which are as follows: General Framework which consist of the introduction and literature review. Chapter one: Money and its functions in economic system. Chapter two: Monetary Policy .Chapter three: Macro-economic variables. Chapter four: Features of Sudanese economy and some macroeconomic variables. Chapter five: Analysis of the impact of monetary policy on macro-economic variables understudy.

(II) Literature Review:

Study No.(1): HABAB MUSTAFA MOHAMMED (2001): [1] **entitled:**

Effectiveness of Monetary Policy in the Framework of Liberalization Policy in Sudan (1992 – 1999):

This study aimed to determine the effect of monetary policy tools and their changes on the national economy level, and to shed light on the application of monetary policy of the stabilization of Sudanese economy. The results of the study were: The Bank of Sudan's monetary policy instruments which were used at the beginning of the liberalization policy did not coincide with the general framework liberalization policy. The fluctuation of macroeconomic policies between supply side policies and demand management polices affected negatively the performance of Bank of Sudan monetary policy, in achieving its objectives. In the last phase of the period under study and due to the stability of macroeconomic policies and their objectives, Bank of Sudan's monetary policy was able to achieve most of its macroeconomic objectives. The study recommended that the stabilization and coordination between monetary policy and fiscal policy to serve their goals. Creation of a new Islamic instrument to support the tools of monetary policy of the Bank of Sudan. Encourage studies and research on preparation and evaluation of monetary policy.

Study No.(2) : ASMA ABDEL RAHMAN KHAIRY (2003): [2] **entitled:**

A model for Sudan's Monetary Sector (1985 – 1999):

This research aimed to analyze the monetary sector in Sudan during the period (1985-1998), through applying a model for this sector, by comparing supply and

1) Habab Mustafa Mohammed Mustafa- Effectiveness of Monetary Policy in the Framework of liberalization Policy in Sudan (1992 – 1999)- M. Sc in Economics- U of K, 2001.
2) Asma Abdel Rahman Khairy- A model for Sudan's Monetary Sector (1985 – 1999)- M. Sc. in Economics - Alneelain University (2003).

demand functions for different monetary assets. The model was modified to suit the specific nature of Sudan economy. The model was built by comparing demand and supply functions of different monetary variables (Currency, deposits … etc). The study followed a quantitative, descriptive method in analyzing the data, and to have a consistent estimator the ordinary least square method will be used. The hypotheses of this study were as follows:

1. Money supply is below the economic capacity i.e the increase in money supply will increase output level through utilization of bank credit.
2. The demand for bank reserve was determined by the requirement to meet cash with drawls i.e reserve in turn determined the ability of banks to supply deposits.
3. The demand for deposits was affected directly by the level of income and in equilibrium the demand function was equal to the supply function.

In the conclusion of the study, it found that the level of income or the expected level of income affected most of the monetary assets. Supply of deposits was affected directly by the reserve ratio and it equals to the demand function in equilibrium, also the demand for bank credit is affected directly by the level of income. The main recommendation of the study was to give profit margin the flexibility needed to become effective as a monetary tool.

Study No.(3): BADER ELDEEN HUSSEIN JUBRALLA (2003): [1] **entitled Demand for Money Function in Sudan (1970 - 1998):**

The study aimed at developing stable demand function for money in Sudan. The main features of instability in Sudanese economy was reflected in the higher rate of inflation and continuous devaluation's of exchange rate of local currency against

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1) Badereldeen Hussein JubrAlla- Demand for Money Function in Sudan (1970 - 1998)- M.Sc. in Economics- Alneelain University (2003).

foreign currencies, especially at the beginning of liberalization policy in 1992. The study was going to compare the various instruments using error-correction model in order to reach specific results regarding demand of money in Sudan, and not generalized ones. The study hypothesized that the real growth in (GDP) was the main factor affecting positively the demand for money in Sudan (1970-1998). There was inverse relationship between the rate of inflation and demand for money in Sudan. Also, the demand for money in Sudan responded negatively to the rate of speculation in foreign currencies, and other factors such as dollarization of assets and degree of monetization. The important findings of the study were; the demand for money function in Sudan can be explained by current real income, expected inflation rate and parallel exchange rate. Real (GDP) affected demand for money positively. Inflation rate and parallel exchange rate affected it negatively. The study concluded that, the error-correction model was an appropriate economic model to explain the demand for money in Sudan for the period under study.

Study No.(4) : MAGDI AHMED NORELDIN (2004): [1] **entitled:**
Sufficiency of Monetary Policy in Sudan (1992-2004):

The study aimed to examine the sufficiency of monetary policy in Sudan and clarify the effectiveness of the tools that were applied for liquidity management. Also, to verify the effort that used to control money supply and the banking finance. The hypotheses of the study were that, there was a reciprocal relationship between the fluctuation and instability on application of monetary policy that reflected on the economic activities and the changes on money supply. The main cause of inflation rate decline was by the fiscal and monetary policies and not caused by the increase of national production and growth of economy. The study

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1) Magdi Ahmed Noreldeen- Sufficiency of Monetary Policy in Sudan (1992-2004), complementary research for M. Sc. in Banking Studies- Sudan University for Sciences and Technology (2004).

followed the time chains methodology to follow the increase and growth of money quantity in Sudan. The results of the study were: The Central Bank has the ability to save the stabilization of money demand by controlling total demand policy by decreasing the government expenditure and increasing the revenues to face the increase of inflation rate, according to large increase in money that results from the increase of financing the deficit on balance budget of the government. Also, the study verified the control of money supply, represented by control of money base, specially the claims of the banking system on the general sector.

Study No.(5) : IBRAHIM ADAM HABIB (2005): [1] **entitled:**

Comparative Study between Monetary Policy in Conventional Banking System and Islamic System (1990-2002):

The aim of the study was to compare between the monetary policy in Islamic system and the conventional monetary policy. The study built on the hypothesis that, the Islamic banking system and the Islamic monetary policy are the perfect substitution for conventional monetary policy if they applied in the appropriate Islamic framework. The Central Islamic Bank could be able to manage the Islamic monetary policy and can affect positively the general economic goals in Islamic countries. The results of this study were: The legal reserve required tools in one of the quantitative monetary policy tools that can be applied was Islamic banking system to manage liquidity. The open market operations had a large effectiveness on management of liquidity and on deficit finance of general budget, to obtain real returns (about 20% in average) compared with other financial tools. The study recommended the application of Islamic economic and banking system in all Islamic countries. To achieve the effectiveness of managing monetary policy, there

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1) Ibrahim Adam Habib- Comparative Study between Monetary Policy in Conventional Banking System and Islamic System (1990-2002)- PhD in economic- University of Khartoum (2005).

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must be coordination between monetary authority of Bank of Sudan and the economic authority the Ministry of Finance about how to plan and apply the macroeconomic policy.

Study No. (6): ABUBEKER ABDALLA OMER (2005): [1]**entitled:**

Analysis of the Impacts of Money Supply on Income and Prices in Sudan (1992-2002):

The study analyzed monetary policies and the impacts on money supply and expected subsequent positive or negative effects on income. Comprehensively, the monetary system can affect economic development and such an issue had great impacts on developing countries. Sudan had witnessed drastic changes in its economic policies and monetary systems. The concurring fluctuations in such policies have had a multitude of effects on foreign exchange rates and hence, prices stability, employment and economic growth. Inflation spirals were witnessed during the past decade. The study suggested several recommendations: One of the most important is to stabilize exchange rates through sectoral economic planning and proper market standards. Additionally, it suggested that an introduction to innovative different styles of demand for investment goods. The analysis of the study revealed that a good solution for high increase of money supply policy was associated with the foreign exchange stability through the mechanism of national planning for economic restructuring. On the individual's level, it was evident that the household can't afford an income surplus. High inflation minimized its ability to save in addition to macroeconomics instability political turmoil and capital scarcity. Such factors severely trim down the production capacity on the individual's as well as the society levels. Therefore, fiscal policy should be concerned with monetary flow, government expenditure

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1) Abu Beker AbdAlla- Analysis of the Impacts of Money Supply on Income and Prices in Sudan (1992-2002)- M. Sc. in Economics- Alneelain University- (2005).

and management of public debts. Greater concerns should be given to regulate the foreign exchange rates. Investment expenditure should occupy a highly significant role in the financing policy because of its feasible impacts on the Sudanese economy's productive capacity.

Study No.(7) : NOURA AHMED ABDUALL (2007): [1]**entitled:**

The Effectiveness of Monetary Policy Instruments Applied in Sudan (1998-2006):

The study analyzed the effectiveness and impact of monetary policy on money supply as an intermediary target and then analyzed the impact of money supply on rate of inflation as ultimate goal in Sudan. The study used a model of simultaneous equation that composed partially on the composition of modified model of the forms used by (Teigen) and part of it used the Fisher Equation. The hypotheses of the study were: The monetary policy was not able to control and adjust the inflation. The monetary policy was more effective in the long term. The results of this study were: The monetary policy instruments under consideration were significant and able to interpret that change in money supply in the long term, but in the short term. It found that the mechanism of open market was not significant (not effective). As for the funding windows and the cost for funding they were significant, but give the impression that the relationship implies that, the system of credit was not tight or not controllable. The effect of changes in the money supply on inflation are not effective in the long term and show limited weak impact in the short term, this means that other variables outside the model having greater impact on inflation. The recommendation was there must be coordination between the monetary policy tools and the financial policy in complementary framework to remove the differences between them.

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1) Noura Ahmed AbduAlla- The Effectiveness of Monetary Policy Instruments applied in Sudan (1998-2006)- M. Sc. in economics- University of Khartoum- (2007).

Study No. (8) : HIND MUSTAFA AHMED (2007): [1] **entitled:**

The Role of Central Bank as Lender of Last Resort in Islamic Economy (Experience of Central Bank of Sudan, (2000-2004):

The study aimed to indentify the success or failure of Central Bank of Sudan as a lender of last resort in Islamic economy. The study hypotheses that there were many effective instruments for the Central Bank to use for playing the role of lender of last resort in the Islamic banks. The Central Bank has effective contribution on financing the deficit liquidity for the other banks. There were many challenges that face the Central Bank to be the lender of last resort in Islamic system. The results were: The commercial bank that reserve (CMCs) from Central Bank not used for the main purpose, but used as fast media to obtain revenue. Also, the given finance from Central Bank to other banks that suffered from liquidity deficit has a small effect on gross domestic product(GDP).

Study No.(9) : SARA YOUNIS ALSHAIKH HASSAN (2010): [2] **entitled:**

Impacts of Monetary and Credit Policies on the Balance of Trade in Sudan (1990-2008):

The study aimed to assess the monetary and credit policies on the balance of trade balance during the period of study, and the efficiency of these policies and their impact on stability and balance of trade locally and abroad.

The approach of this study was the descriptive method based on statistical analysis. The most important results of the study were: Monetary and credit policies followed by the Central Bank of Sudan through the study period have had

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1) Hind Mustafa Ahmed- The Role of Central Bank as Lender of Last Resort in Islamic Economy (Experience of Central Bank of Sudan, (2000-2004)- Complementary research for M. Sc. in Banking Studies- Sudan University for Science and Technology- (2007).
2) Sara Younis Alshaikh Hassan- Impacts of Monetary and Credit Policies on the Balance of Trade in Sudan (1990-2008)- PhD in economics- Sudan University for Science and Technology- (2010).

a positive role in controlling the movement of exports. Monetary and credit policies followed by the Central Bank have had a positive role in controlling the movement of imports. Monetary and credit policies followed by the Central Bank contributed to directing the banks employ a great deal of credit to finance the credit ceilings in the agricultural sector and livestock. The most important recommendations of the study included: Attention must be given to the diversification of the export sector (agricultural and animal) in Sudan. Because Sudan had comparative advantage in this area (vase ,fertile ,arable land, and normal irrigation). The issue of development of international exchange and foreign trade needed an integrated package of policies in various fields. The most important recommendations were: Focus on productive activities where the state has comparative advantages and then develop this feature to become competitive advantage. Also, focused on the area of technological advantages tangles which deepen relations with various sectors.

Study No.(10): MAGDA HAMZA KHALEIFA BASHEER (2010): [1]entitled: Impact of Monetary Policy in a Dual Banking system (1970-2008)

The major theme of this study was to analyze the monetary policy in Sudan and with special attention to the period in which the application of the dual banking system took place according to Comprehensive Peace Agreement (CPA) in 2005. The objectives of the study were to determine the ideal monetary policy that can be applied in Sudan due to the existing requirements, and to determine the efficiency of this policy. The study was based on the following hypotheses: There was a direct interrelated relationship between the effective monetary policy and the financial policy. Usury transactions (Lending money at a rate of interest) lead to monetary and financial crises. The economic system which was based on interest

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1) Magda Hamza Khaleifa Basheer- Impact of Monetary Policy in a Dual Banking System (1970-2008)- PhD in economics- Sudan University for Science and Technology- (2010).

rate leads to accumulation of foreign debts in developing countries, and this affects the economic structure of these countries negatively. The study adopted the analytical and empirical methods. The results were: The absence of coordination between the monetary policy and the financial policy before 1996 in the Sudan led to negative economic effects, but the economic indicators improved later as a result of the coordination between the two policies. Adopting of policies based on the rate of interest led to economic crises and accumulation of foreign debts. The traditional banking system could not participate in the development that needed by the Southern Sudan compared with Islamic banking system. The important recommendations were: Adoption of interest-free monetary policy locally and internationally to maintain a comprehensive, stable, and suitable economic growth.

Study No.(11) : IBRAHIM ABDELRASOUL MOHAMMED (2011): [1]**entitled:**

Sources and Impact of Government Budget Deficits on the Economy (1970-2006):

The research attempted to examine the source of government deficits and their impact on Sudanese economy during the period (1970-2006). For the purpose of comparison, the above period was divided into two sub-periods, the first was (1970-1989), the second was (1990-2006). This study was an attempt to answer questions such as: what are the main causes of budget deficit in Sudan ? What are their impacts on major macroeconomic activities? The study attempted to test the following hypotheses, budget deficit in Sudan was a persistent phenomena caused by a dramatic expansion in public expenditure. The immediate effect of budget deficits on inflation is indirect, which could be understood through the way of

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1) Ibrahim Abdel Rasoul Mohammed- Sources and Impact of Government Budget Deficits on the Economy (1970-2006)- PhD in Economics- Sudan University for Science and Technology- (2011).

financing budget deficit. Therefore, the expected sign will be negative. The direct effects of budget deficit on exchange rate was hypothesized to be positive. The descriptive and analytical results were shown as follows: During the first sub-period (1970-1989), government revenues, appeared to be the main detrimental factor, which shown significant impact on budget deficits, and foreign borrowing was the main source for financing the deficit, which resulted in accumulation of public debt and services. In the second sub-period (1990-2006), total government expenditure was the most detrimental variable, more specifically expenditure had significant impact on budget deficits and bonds financing is the main source of financing the government budget deficits. The government budget deficits had indirect effect on the selected macroeconomics variable. Thus during the first sub-period budget deficits were positively related to exchange rate, while during the second sub-period, budget deficit had positive impact on(GDP).

Study No.(12) : ALAMIN ABAKER ABDEL BAGI AKHOONA (2012): [1]**entitled: The Role of Monetary Policy in Allocating Financial Resources to the Economic Sectors (1984-2009):**

The main objective of this study was to evaluate the monetary policy of the Central Bank of Sudan during the period (1970-1983) which was depending on the rate of interest compared with the Islamic Monetary Policy adopted during the period (1984-2009) and the effects of these policies on the financial resources of traditional and Islamic banks and their uses and trends.

The main hypotheses of the research were firstly: The traditional and Islamic banks relied on financial resources owned by the others (depositor) seek to invest

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1) Al Amin Abakar Abdel Bagi Akhoona- The Role of Monetary Policy in Allocating Financial Resources to the Economic Sectors (1984-2009)- Comparative Study between Traditional and Islamic Banks in Sudan)- PhD in Economics- Alneelain University, 2012.

these resources on the most secured activities . Secondly: The financial resources of traditional and Islamic banks are short-term and refundable at any time, this fact will not allow these banks to invest in the long-term investment projects. Thirdly: Banking system stability was the responsibility of the Central Bank both traditional and Islamic, so these banks will not allow commercial banks to invest their resources in the project which may cause repayment and liquidity problems to these banks. Fourthly: increasing the cost of capital by the Central Bank will reduce the commercial banks lending to the productive sectors. The important results were: The ratio of basic financial resources of traditional and Islamic banks (Capital, savings and investment deposits) to their total resources was low. So this would not help these banks to invest in long-term investment projects. The ratio of savings and investment deposits was higher in Islamic banks, but the rate of resources employed in financing activities was higher in traditional banks. The monetary policy adopted by Central Bank of Sudan failed to encourage both traditional and Islamic banks to increase their finance in productive sectors of the economy, namely agriculture, industry, and exports. The main recommendations of the study were: Due to the nature of the financial resources of traditional and Islamic banks, the role of these banks in economic development should be complementary to the role of government. The rate of growth in banks' credits should not exceed the rate of growth of the economy. The returns from government certificates should be calculated from the actual performance of the government projects constituting these certificates and the government should not use these returns in financing current expenditure.

Study No.(13) : ALHAFIZ IBRAHIM AHMED (2012): [1]**entitled:**

The Impact of Monetary and Fiscal Policies in the Development of Agriculture and Industrial Sectors in Sudan (2000-2012):

The study aimed to highlight the effect of monetary and fiscal policies in the development of the agricultural and industrial sectors in Sudan based on the importance of both sectors to human and animal taking in consideration the appropriate planning mechanisms. The problem of the study lied on the lack of appropriate monetary and fiscal policies to develop both sectors which led to scarcity in production in both quantity and quality, it also led to increase in prices and decrease of profits which automatically decrease investment in these sectors and led to little exports and reduce the amount of demand for these products locally and globally. The study hypothesized that the financial and monetary policies led to negative effects on these two sectors, and the deficiency of funds granted to the agricultural sector affected negatively the agricultural production. The study used historical, deductive, and analytical approach as research methods, also used special statistics package to analyze data. The significant findings such as, lack of appropriate funds to the agricultural sector, rising of inflation rates, instability of exchange rate, and the continuous deficit in the budget. The recommendations were: The government should adopt clear policies to control the rate of growth of money supply, the need to stabilize foreign exchange rates, setting budget to achieve high specific goals and work out to increase revenues.

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1) AlHafiz Ibrahim Ahmed- The Impact of Monetary and Fiscal Policies in the Development of Agriculture and Industrial Sectors in Sudan (2000-2012)- PhD in economics- Sudan University for Science and Technology- (2012).

Study No.(14) : ZOELNOON MOHAMMED HAMID OTHMAN (2013): [1]**entitled**:

Impact of Macroeconomic Variables on the Wages of Public Sector in Sudan (1970-2009):

The study handled the impact of macroeconomic variables on the levels of wages in the Sudan. The wages problem was gained great importance in economic, social and psychological thought in old time. This was because of the significance of wages in the life of individuals which have passed over several development and various thoughts.

The wages considered a focal point in the dynamizing of the society together. The objective of this study was to build simultaneous model that link economic policies. The study recommended paying more attention to the problem of unemployment and its adverse effects, linking the increase of wages with increase of production financing increases in wages from true resources. Minimum wages must be linked to the expenditure on living, to avoid the problem of inflation, which was the loss of real value of wage. Finally, support of supreme council wages, with the capacities and scientific and technical qualified persons. The assumption that it was only tool, for setting comprehensive policies which suitable and fair for wages, in both the public and private sectors.

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1) Zoelnoon Mohammed Hamid Othman- Impact of Macroeconomic Variables on the Wages of Public Sector in Sudan (1970-2009)- PhD in Economics- Sudan University for Science and Technology- (2013).

Study No.(15): DALIA MOHAMMED ISMAEAL AHMED (2014): [1]**entitled: Impact of Financial Policy on Sudan Gross National Product (GDP) (1992-2012):**

The objective of the study was to investigate the impact of financial policy in the Gross National Production (GNP) by studying the case of the Sudan. The problem of the study was to determine the relationship between (GNP) and the fiscal policy that have represented in government expenditure and external debt. The study hypotheses were stated that, there was an existence of a positive relationship between the (GNP) and the tools of fiscal policy have represented in government expenditure and external debt, while there was an existence of a negative relationship between (GNP) and tax . The main findings of the study were: There was a direct positive statistically significant relationship between (GNP) and government expenditure. There was indirect negative statistically significant relationship between (GNP) and indirect tax. The research recommended the following: There was a need to focus on the part of indirect taxes, duty taxes on imported goods that correspond to domestic products, and the tax concisions for projects that contributed to the increase of production , in addition to direct public expenditure toward production projects such as mining sector to get new revenues as an alternative to petroleum revenues. Foreign loans were needed to be directed towards productive sectors in the economy and social overhead capital. Reduction of foreign loans that have imposed difficult conditions which lead to the accumulation of foreign debt.

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1) Dalia Mohammed Ismael Ahmed- Impact of Financial Policy on Sudan Gross National Production (1992-2012)- PhD study in Economics- Sudan University for Science and Technology- (2014).

Study No.(16) : OMAMA MAKKI MOHAMMED ALSAYED (2015): [1]**entitled: Causality Relation between Money Supply and Inflation Rate in Sudan (1990-2012):**

The aim of the study was to determine the nature of relationship between the inflation and the money supply in Sudan, using monthly data. The analysis results showed that the money supply series was stationary in its value, and the inflation series become stationary after taking the first difference, there was a co-integration relation between inflation and money supply in long-run. The granger causality test reveals bi-direction relationship between money supply and inflation rate in the short-run, and the direction of the relationship was uni-direction move from broad money to inflation in the long-run. The research recommended finding tools to absorb the increase of money supply in the economy and create a new channel to finance government deficit than borrowing from the banking system.

Study No.(17) : LAYLA ALI ALGHSHAT (2015): [2]**entitled:**

The Measurement of Effect of Monetary Policy on Inflation in Sudan (1994-2012):

The study dealt with the measurement of effect of monetary policy on inflation in Sudan. The problem of the research was represented by measuring the extent of effectiveness of the monetary policy in Sudan to curb down the high rates of inflation during the period of the research and to avoid the economic effect of this phenomenon. It also, tracks the effectiveness of policies of the Central Bank of Sudan to reduced inflation. The objective of the study was to measure the effect of monetary policy in reducing inflation and to study the impact of money supply,

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1) Omama Makki Mohammed Alsayed- Causality Relation between Money Supply and Inflation Rate in Sudan (1990-2012)- M. Sc in economics- Sudan University for Science and Technology- (2015).
2) Layla Ali Alghshat- The Measurement of Effect of Monetary Policy on Inflation in Sudan (1994-2012)- M. Sc in economics- Shendi University- (2015).

money reserve and the margins of profit sharing on inflation. The study used the descriptive analytical methodology to describe the theoretical and applied components of study and analyzing data and inflation using the statistical package of social sciences(SPSS) caused by the macroeconomic variables .The recommendations of this study were such as, initiation of monetary tools that suits the Sudanese economy which comply with the policies of Central Bank of Sudan, to reduce money supply so as to relieve the pinch of inflation in the Sudan and to increase the percentage of money reserves and margins of profit sharing so as to reduce money supply and hence curb down inflation.

Most of these researches and this research dealt with the impact of monetary policy and its role in the Sudanese economy through different views and how it affect other macro-economic variables . Also, most of them used the descriptive analytical method and the Statistical Package of Social Sciences (SPSS)for analyzing the data of the study. The most important result was the important of the Central Bank to manage the liquidity and money supply. Moreover used of Islamic monetary instruments are more suitable in Sudan .This research adopted four models to verify the hypotheses of the research.

CHAPTER ONE

MONEY AND ITS FUNCTIONS

IN ECONOMIC SYSTEM

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MONEY AND ITS FUNCTIONS
IN ECONOMIC SYSTEM

(1/1) Definition and Concept:

Money is defined as anything which is generally accepted in payments for goods and services and in the repayments of debts. Currency (paper money and coins) clearly fits this definition and is one type of money.

To define money as currency is too narrow for economists. Because checks are also accepted as payments for purchases, checking account deposits are considered as money. A broader definition of money often needed, because other items such as saving deposits function as money, because they can easily and quickly be converted into currency or checking deposits.

In the past, before money was used, transactions took place by means of barter. Barter is simply a direct exchange of goods and services for another goods and services without use of money. In barter system, there has to be double coincidence wants. Barter is costly and time consuming .The time is wasted in looking for someone who has exactly that goods or services you want and who want what you have to trade. The barter system has an important downside since it requires a double coincidence of wants, in other words, the two parties engaged in trade must both want what the other is offering. [1]

Hence the barter system was costly and time wasting, people thought for another thing to use as money. They thought of what known as commodity money.

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1) R. Gllen Hubbard and Anthony Patrick O' Brien- Economics – USA – Third Edition – Pearson Education Inc – 2010, P. 26

The commodity money is a commodity that has a real value. If it has lost its function as money, it is still a commodity. Cattles were commonly used as money in pre-Christian times, and even recently by some primitive tribes. Some other things have been used as money, such as cloth, corn, slaves, knives, and beer. They were types of money that have value in their selves and are accepted and preferred by people. The commodity money has many disadvantages that it is difficult to use as a store of value or as method of saving. Also, it is difficult to breakdown.

In the seventh century B.C. metal coins were first used as money in ancient Lydia. These coins were usually made from an alloy of gold and silver .The designs on coins help them to gain recognition and acceptance. Coins have value stamped on them .Paper money originated with gold smiths during the seventeenth century in London. The goldsmiths gave people receipts for their coins and precious metals .It developed that, these receipts would then be transferred from person to person as means of payment. [1]

In the United States, after the revolutionary war and during the next century, paper money in the form of banknote was issued out by privately owned banks. When the civil war broke out, the federal government printed paper money itself to help finance the war. In 1913 when the Federal Reserve system was established which monopolized the issuance of banknotes. Money has been different things at different times. But it has always important to people and to economy.

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1) Turely Mings and M. Marlin – The Study of Economic, Principles, Concepts and Application- Fifth Edition- McGraw – Hill/Dushkin- 1999, p. 256.

(1/2) Functions of Money:

Whatever the type of money is, it has four primary functions in any economy: As a medium of exchange is what distinguishes money from other assets such as stokes, bonds and houses.

(1/2/1) Medium of Exchange:

To increase the volume of transactions and live in a modern economy , the most important function of money is to serve as medium of exchange . People can sell their output for money and subsequently use the money to buy what they want from others. Money removes the problem of coincidence of needs because everyone is willing to accept money in payment , rather than goods and services. Money if used as currency or check is a medium of exchange, it is used to pay for goods and services. The use of money as medium of exchange promotes economic efficiency by minimizing the time spent in exchanging goods and services. In order to properly serve as a medium of exchange whenever used as money, it must have a number of characteristics .It must be readily acceptable and of known value,. It must be divisible , universally recognized, have an adequate but limited supply , not easily produced , and can easily be portable and durable. [1]

(1/2/2) Money as A Store of Value:

Money functions as a store of value, it is a repository of purchasing power over time. A store of value is used to save purchasing power from time income is received until it is spent. Money is not alone as a store of value; any asset, whether money, stocks, bonds, land, houses or jewelry – can be used to store wealth. Many assets have advantages over money as a store of value, they often pay the owner a higher interest rate than money experience price appreciation. But money is preferred by people, because it relates to the important economic concept of

1) Turely Mings and M. Marlin – previous reference, P. 258 – 259.

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liquidity, which is the relative easiness and speed with which an asset can be converted into a medium of exchange. liquidity is highly desirable. Money is the most liquid asset of all because it is the medium of exchange, it does not have to be converted into anything else to make purchase. Other assets involve transaction costs when they are converted into money and time delays.

Inflation plays a major role in determining the effectiveness of money as a store of value . The higher the inflation rate , the faster the purchasing power of money falls . In high- inflation countries workers spend their pay as fast as possible .In countries where the domestic money does not serve as a good store of value , it ceases to fulfill this function of money , and people begin to use something else as money , like the currency of another nation ,e.g: US dollar. Currency substitution has been documented in Latin America during times of high inflation .

(1/2/3) Unit of Account:

Money also used purely for accounting purposes without having a physical existence of its own . (GDP) is money value of final goods and services used to compare the national output of any country to another . Money as a unit of account is used to measure value in the economy. People measure the value of goods and services in terms of money. In international transactions where countries used different medium of exchange, (Franks, Mark, Pounds and Dollar), USA dollar is used as unit of measurement.

The unit of measurement should itself be stable in value. Another way of describing money as a unit of accounting is that, it serves as a standard of value that allows economic actors to compare relative worth of various goods and services. Money ability to serve as a unit of account over time can be diminished if inflation is significant . [1]

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1) Turely Mings and M. Marlin – previous reference, P. 258 – 260.

(1/2/4) Money as A standard of Deferred Payment:

A related function of money is that it can be used as a standard of deferred payment . Payments that are to be made in the future , on account of debts , and so on , are reckoned in money . This function involves the use of money both as a medium of exchange and as a unit of accounting .Debts are typically stated in terms of a unit of accounting, they are paid with a monetary medium of exchange. That is to say, debt is specified in dollar amount and paid in currency or by check.

(1/3) Characteristics of Money:

Money has many characteristics that distinguished it from other things, which are:

(1/3/1) Durability:

Durability means that the item must be able to exist for a long time without deterioration and to withstand being used repeatedly. Durability is critical for money to perform the related function of medium of exchange and a store of value. Items that are considered currency coins and paper bills used as money meet this requirement. Nowadays, money is made out of paper, metal and plastic which made money long lasting.

(1/3/2) Portability (Easy to Transport):

Portability means that individuals are able to carry money with them and transfer it easily to other individuals. This is why coins and paper money have historically proved popular. In modern days money is carried from one place to another with less effort where a wallet can carry any type of money including, notes, coins and debit cards. [1]

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1) Irvin B. Tucher- Economic for Today's World- USA- Seventh Edition- South Western Cengage, 2012, P. 648.

(1/3/3) Divisibility:

Divisibility means that the money can easily be divided into smaller units of value. When people used stones and cattle as money they were not able to divide them into small pieces in a standard form where they used it whole or divided into small pieces but it was lacking standardization. In modem days people have notes and coins from low values to high value where they are used to divide money into small units of account.

(1/3/4) Uniformity:

Uniformity means that all versions of the same denomination of currency must have the purchasing power.

(1/3/5) Limited Supply:

Limited Supply means that restrictions on the amount of money in circulation ensure that values remain relatively constant for the currency. Respective country's Government has the responsibility to control and maintain an adequate money supply to the market based on their monetary policy.

(1/3/6) Acceptability:

Acceptability means that everyone must be able to use the money for transactions. Money is universally accepted anywhere in the world as a universal mean of transactions.

(1/4) Types of Money:

There are five types of money, which are: [1]

(1/4/1) Commodity money:

Commodity money is the simplest kind of money which is used in barter system where the valuable resources fulfill the functions of money. The value of this type of money comes from the value of resource used for the purpose. It is

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1) Frederic S. Mishkin- The Economics of Money, Banking and Financial Market-Tenth Edition, USA- Pearson Education Publish Inc.-2013- P. 289.

only limited by the scarcity of the resources. Value of this type of money involves the parties associated with the exchange process. These money have intrinsic value.

Whenever any commodity is used for the exchange purpose, the commodity becomes equivalent to the money . There are certain types of commodity, which are used as the commodity money. There are several precious metals like gold, silver, copper and other.

(1/4/2) Fiat money:

The word fiat means the (command of the sovereign). Fiat currency is the type of money which don't have any intrinsic value and it can't be converted into valuable resource. Fiat money is valuable because it is accepted by convention and in law in payment for the purchase of goods or services and for the discharge of debts . The value of fiat money is determined by government order which makes it a legal instrument for all transaction purposes. The fiat money need to be controlled as it may affect the entire economy of a country if it is misused. Today Fiat money is the basis of all the modern money system. The real value of fiat money is determined by the market forces of demand and supply. Coins and paper money are fiat money. Coins are metal of particular weight of gold, silver or bronze. Its value stamped on it. Paper money doesn't have intrinsic value. It's approved by government order to be treated as legal tender through which value exchange can happen. Governments print paper money according to the requirement which is tightly controlled as it can affect the whole economy of the country. [1]

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1) Frederic S. Mishkin, previous reference. P. 289.

Many people are disturbed to learn that present –day paper money is backed by gold or silver . This is not true. There is nothing backing the currency except the confidence of the public.

(1/4/3) Fiduciary Money:

Today's monetary system is highly fiduciary. If any bank assures the customers to pay in different types of money and when the customers can sell the promises or transfer to somebody else, it's called fiduciary money. The monetary system is based on trust . Fiduciary comes from the Latin fiducia, which means trust. Fiduciary money is generally paid in gold, silver or paper money. Checks and bank note are example of fiduciary money because both are some kind of token which are used as money and carry the same value. [1]

(1/4/4) Fractional Money:

Goldsmith quickly realized they only needed a small portion of their stock piles on hand for redeeming customer receipts for their gold. So it logically followed that to collect more interest, they could loan more money than they had on hand by using receipts backed by nothing except the goldsmith. Goldsmith's knowledge is that all their depositor would not come to collect their gold on any given day. Thus fractional receipt money was born, the precursor to present day banking system.

(1/4/5) E-Money:

Electronic payments technology can substitute not only checks but also cash in the form of electronic money (E-money). The first form of E-money is the debit card. Debit card look like credit card enable consumer to purchase goods and services by electronically transferring funds directly from their bank account to a merchant's account. Debit cards are used in many of the same places that accept

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1) Frederic S. Mishkin, previous reference. P. 290.

credit cards and are now often becoming faster to use than cash. The second form of E-money is the store- value card, which is known as smart card. It contains a computer chip that allows it to be loaded with digital cash from the owner's bank account wherever needed . Smart card can be loaded from (ATM) machines or personal computer with smart card . A third form of E-money is referred to as E-cash, which is used on the internet to purchase goods and services. A consumer get E-cash by setting up an account with a bank that has links to the internet. [1]

(1/5) Measuring Money:

The definition of money as anything that is generally accepted in payment for goods and services tell us that money is defined by people's behavior. What makes an asset money is that people believe it will be accepted by others when making payment. Many different assets have performed this role over centuries, ranging from gold to paper currency to checking account. For that reason this behavioral definition does not tell which asset in the economy should be considered money. To measure money, we need a precise definition to tell us exactly which asset should be included. The problem of measuring money has recently become crucial because extensive financial innovation has produced new type of asset that might properly belong in a measure of money. There are two approaches to measure money: Transactions approach, which stresses the role of money as a medium of exchange. The liquidity approach, which stresses the role of money as a store of value. These measuring approaches, measure money supply which is referred to as money aggregates.

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1) Frederic S. Mishkin, previous reference. P. 290.

(1/5/1) Transactions Approach:

The narrowest measure of money that Central Bank report is (M_1), which include the most liquid assets: Currency, checking account deposits and traveler's check. The currency components of (M_1) include only paper money and coins in the hand of the non-bank public and doesn't include cash held in (ATMs) or bank vaults. The travelers checks component of (M_1), only traveler's checks not issued by bank. The demand deposits component include business checking account that does not pay interest as well as traveler's check issued by bank. The other checkable deposit items include all other checkable deposits particularly interest – bearing checking account held by household.

(1/5/2) Liquidity Approach:

(M2) monetary approach adds to (M_1) other assets that are not quite as liquid as those in (M_1): Assets that have check-writing features (money market deposit account and money market mutual fund shares) and other assets (savings deposits and small-denomination time deposit are certificates of deposit with a denomination of less than $100,000 that can be redeemed only at a fixed maturity date without a penalty. Savings deposits are non-transaction deposits that can be added to or taken out at any time. Money market deposit accounts are similar to money mutual funds, but are issued by banks. The money market mutual fund shares are retail account on which households can write checks. Table (1/1) shows the measures of monetary aggregates: [1]

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1) Frederic S. Mishkin, previous reference. P. 291.

Table (1/1): Measure of Monetary Aggregates

M$_1$	M$_2$
Currency	M$_1$
Plus	Plus
Traveler's checks	Small-denomination time deposit
Plus	Plus
Demand deposits	Savings deposits and money market deposit accounts
Plus	Plus
Other checkable deposits	Money market mutual fund shares (retail)

Source: Prepared by the researcher

(1/6) Monetary Institutions:

In 1900, only 18 countries had Central Banks. Even US Federal Reserve didn't begin operating until 1914. As the importance of the government and the financial system grew, the need for a central bank grew along with it. The Central Banks started out as the government's bank and over years added various other functions. Also, it is the bankers' bank.

The primary reason for a country to create its own central bank, is to ensure control over its currency. Giving the money-printing monopoly to someone else can be disastrous ,resulting in high inflation and damage to the economy's ability to function smoothly.

(1/6/1) Central Bank:

A Central Bank generally can be defined as a financial institution responsible for overseeing the monetary system for a nation with the goal of fostering economic growth without inflation. The core objectives of Central Bank in any country are: to mange monetary policy with the aim of achieving price stability, to prevent liquidity crises, situation of money market disorders and financial crises, and to ensure the smooth functioning of payment systems. The main functions of a Central Bank can be listed as follows: [1]

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1) Stephen G. Cecchetti- Kermit L. Schonholtz and James Fackler – Money, Banking, and Financial Market – USA – Third Edition – McGrawill – 2006 – P. 415.

1. The central bank controls the issue of notes and coins (legal tender). The central bank will have a monopoly of the issue and has power to restrict the amount of private issues of notes and coins.

2. It has the power to control the amount of credit money created by banks. It controls money supply by either direct or indirect means.

3. A central bank should have some control over non-bank financial intermediaries that provide credit.

4. Central bank should effectively use the relevant tools and instruments of monetary policy in order to control credit expansion, liquidity and money supply of an economy.

5. It should oversee the financial sector in order to prevent crises and as a lender-of-last resort in order to protect depositors, prevent wide-spread panic with-drawl, and prevent the damage to the economy caused by the collapse of financial institutions.

6. Central bank acts as the government's bank. It hold the government's bank account and performs certain banking operations for the government, such as deposits and lending. In its capacity as banker of the government. It can manage and administer the country's national debt.

7. The central bank acts as the official agent to the government in dealing with all its gold and foreign exchange matters. [1]

The Central Bank is the money supplier of the monetary base and as a consequence, can determine the conditions upon which banks borrow from the central bank. The Central Bank can influence liquidity in short term money markets and so can determine the conditions at which banks buy and sell short-term wholesale funds. By influencing short-term money market rates, the central

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1) Stephen G. Cecchetti and other, previous reference – P. 415.

bank influences the price of liquidity in the financial system and ultimately can affect various economic variables such as output or prices. In long-run a change in the quantity of money in the economy will be reflected in a change in the general level of prices but it will have no permanent influence on real variables such as the level of output or unemployment. This is known as the long-run neutrality of money. The real income or the level of employment are in the long-term, determined by real factors, such as technology, population growth or the preferences of economic agent.

(1/7) Types of Monetary Institutions:

The banking sectors of most countries have a pyramid structure where the central bank is at the apex and ordinary banking institutions are at the base of the pyramid. Central Banks can also be thought of as supper-banks, at the center of the financial system, responsible for both macro functions, such as monetary policy decisions and micro functions, including the lender-of-last resort (LOLR) assistance of the banking sector. There are many types of banks which are :

(1/7/1) Retail or Personal Banks:

Retail or personal banks relates to financial services provided to the customer and are usually small-scale in nature. Typically, all large banks offer abroad range of personal banking services including payments services (current account with check facilities, credit transfers, standing orders, direct debits and plastic cards), savings, loans, mortgage, insurance and other services.

A variety of different types of banks also offer personal banking services. These banks include: [1]

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1) Stephen G. Cecchetti and other, previous reference – P. 416.

- Commercial banks.

- Saving banks.

- Co-operating banks.

- Building societies.

- Credit unions.

- Finance house .

(1/7/2) Private Banks :

Private banks are concerned with the high-quality   provision of a range of financial and related services to wealthy clients, principally individuals and their families. Typically, the services on offer combine retail banking products, such as payment and account facilities plus a wide range   of investment-related services. Market segmentation and the offering of high quality services provision form the essence of private banks and key components which include:

- Tailoring of individual client requirement .

- Anticipation of client needs.

- Long-term relationship orientation.

- Discretion.

- Personal contact.

The market of private banking services has been targeted by many large banks because of the growing wealth of individuals and the relative profitability of private banking business.

(1/7/3) Corporate Banks:

Corporate banks relates to banking services provided to companies, typically the term refers to services provided to relatively large firms. Banking services

provided to small and medium sized firms are in many respects similar to personal banking services, and the range of financial products and services on offer increases and grows in complexity, so the larger the company the more complex and higher the banking services offered .

The main banking services used by different sizes of firms are as follows:

- **Banking services used by small firms:**

  There are four main types of banking services offered to small firms:

1. Payment services.

2. Debt services.

3. Equity finance.

4. Special finance.

- **Banking services for mid-marked and large firms**:

  The core banking products and services typically focus on the following range of needs:

  1. Cash management and transactions.

  2. Credit and other debt financing facilities .

  3. Foreign exchange and interest rate transactions.

(1/7/4) Investment Banks:

Investment banks mainly deal with companies and other large institutions and they do not deal with retail customers – a part from the provision of up market private banking services. The main role of investment banks is to help companies and government raise funds in the capital market either through the issue of stock (referred to as equity or shares) or debt (bonds). Their main business relates to issuing new debt and equity that they arrange on behalf of clients as well as

providing corporate advisory services on mergers and acquisitions and other types of corporate restructuring. Their activities cover the following areas:

- Financial advisory.
- Underwriting of securities issues (guaranteeing a price that new equity or bond issue will sell for).
- Trading and investing in securities on behalf of bank or for client. This activity can include trading and investment in a wide range of financial instruments including bonds, equities and derivative products.
- Asset management – managing wholesale investments as well as providing investment advisory services to wealthy individuals (private banking) and institutions.

The main difference between commercial banks and investment banks is that commercial banks refer to deposit and lending business while the investment banks relate to securities underwriting and other security-related business. In terms of services offered to large companies, commercial banks typically provide cash management, payment and credit facilities, whereas investment banks arrange other types of financing through the issue of equity and debt to finance company expansion.

(1/7/6) Islamic Banks:

Islamic banks business that is occurring in various parts of the world and is based on non-interest principles. Islamic (Shariah) law prohibits the payment of Usury (Riba) or interest but does encourage entrepreneurial activity. Such, banks that wish to offer Islamic banking services have to develop products and services that do not charge or pay interest. Their solution is to offer various profit sharing-related products, whereby depositors share in the risk of the bank's lending. Depositors earn a return (instead of interest) and borrowers repay loans on the

profits generated from the project on which the loan is lent. A commonly used profit-sharing arrangement in Islamic banking is known as Musharakah, which is an arrangement where a bank and a borrower establish a joint commercial enterprise and all contribute capital as well as labor and management as a general rule. The profit of the enterprise is shared among the partners in agreed proportions while the loss will have to be shared in strict proportion of capital contribution. There is a wide variety of Islamic banking products and services based on various profit sharing and other forms of arrangements that enable financial intermediation without the use of interest.

CHAPTER TWO

MONETARY POLICY

CHAPTER TWO
MONETARY POLICY

(2/1) Definitions and Concept:

Monetary policy is how Central Bank manages the money supply to guide stable economic growth. Money supply includes credit, cash, checks and money market mutual funds. The most important of these is credit, which include loans, bonds, mortgage and other agreements to repay.

Monetary policy is the process by which the monetary authority of a country controls the supply of money, often targeting an inflation rate and interest rate to ensure price stability and general trust in the currency.

Monetary policy is the action of the Central Bank, currency board or other regulatory committee that determine the size and rate of growth of money supply, which is in turn affected interest rate. Monetary policy is maintained through some actions such as modifying the interest rate, buying or selling government bonds, and changing the amount of money banks are required to keep in the vault (bank reserves).

(2/2) Monetary Policy Objectives:

Monetary policy is one of the main policy tools used to influence interest rates, inflation and credit availability through changes in the supply of money (or liquidity) available in the economy. The ultimate goal of monetary policy is economic growth with stable prices . Economic growth means greater output ; stable prices mean a low , steady rate of inflation. The main objectives of monetary policy include: [1]

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1) Michael Melvin and William Boyes – Principle of Economics – USA – Eighth Edition – China Translation and Printing Services Limited – 2011 – P. 325.

- **High Level of employment**:

  High level of employment is a major goal of monetary policy. Having a high level of employment result in the economy having best utilized resources that result in higher levels of production and income, higher growth and social prosperity.

- **Price stability**:

  Price stability is desirable because arising price level creates uncertainty in the economy and this affect economic growth.

- **Stable economic growth**:

  Stable economic growth provides for the increases over time in the living standards of the population.

- **Interest rate stability.**

- **Financial market stability.**

- **Stability in foreign exchange markets**.

(2/3) Tools of Monetary Policy:

Central Banks have a long list of goals and short list of tools they can use to achieve these goals. They are supposed to stabilize prices, output, the financial system, exchange rate and interest rate. Yet the only power they have comes from their control over their own balance sheet and their monopoly on the supply of currency and reserves. [1]

Tools of monetary policy are of two types :

1. **Conventional monetary policy tools**.

2. **Non-conventional monetary policy tools.**

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1) Michael Melvin and William Boyes – previous reference – P. 325.

(2/3/1) Conventional Monetary Policy Tools:

During normal times, the Central Bank uses three tools of monetary policy to control money supply and interest rate which are:

a) Open Market Operations:

They are the most important conventional monetary tool because they are the primary determinants of changes interest rates and monetary base .They are the main source of fluctuations in money supply . They deal with buying and selling of government and Federal agency bonds. Open market purchases expand reserves and monetary base , thereby , increasing money supply and lowering short – term interest rates. Open market sales shrink reserves and the monetary base , decreasing money supply and raising shot –term interest rates.

To achieve their goals, policy makers can change the size of monetary base by buying and selling assets (primarily government securities).

Open market operations are of two types:

- **Dynamic open market operations**: That intended to change the level of reserve and monetary base.
- **Defensive open market operations**: Are intended to offset movement in other factors that affect reserve and monetary base.

There is some equilibrium level of interest rate and bond prices outstanding. When the Central Bank wants to conduct open   market operations, it must somehow induce individuals, businesses, and foreigners to hold more or fewer bonds. The inducement must be in the form of making people better off.

If the Central Bank wants to purchase bonds in the government market the amount of check that it issues to pay for the bonds becomes an addition to the

reserves of the banking system. This gives them more money to lend . If the Central Bank sells bonds, it places them on the Bank's balance sheets and reduces its cash holdings. The bank has less to lend. Thus an open market operations must cause a change in the price of bonds.

The Central Bank sells some of the bonds in its portfolio, this is shown in figure (2/1). The supply of bonds is shown here as a vertical line with respect to price. The demand for bonds is downward sloping. If central bank offer more bonds for sale, it shifts the supply curve from (S_1) to (S_2). It cannot induce people to buy the extra bonds at the original price of (P_1), so it must lower the price to (P_2).

If the Central Bank purchase bonds, the opposite occurs. In figure (2/2), the original supply curve is (S_1). The new supply curve of outstanding bonds will end up being (S_3) because of the Central Bank purchases of bonds. This purchase of bonds can be viewed as a reduction in the stocks of bonds available for private investors to hold. To get people to give up these bonds, the central bank must offer them more attractive price. The price will rise from (P_1) to(P_3). This is the equivalent of a reduction in the supply of bonds available for private investors to hold. [1]

1) Roger Le Roy Miller – Economics Today – Ninth Edition – Wesley Educational Publisher inc – 1997 – P. 370.

Figure (2/1): Sell Bonds
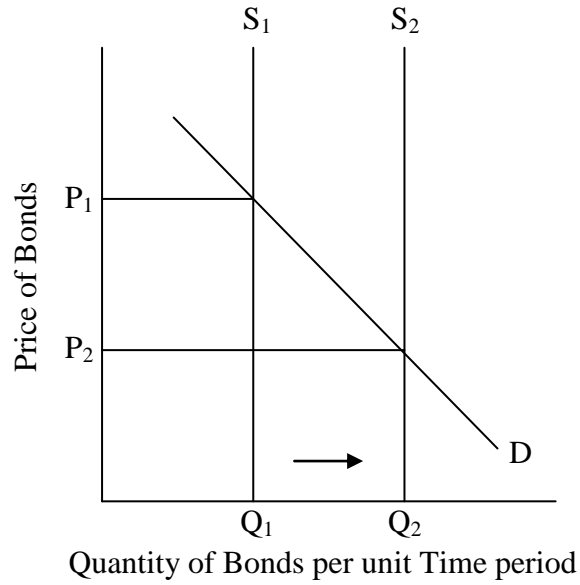
Source: Roger Le Miller- previous reference.

Figure (2/2): Buy Bonds
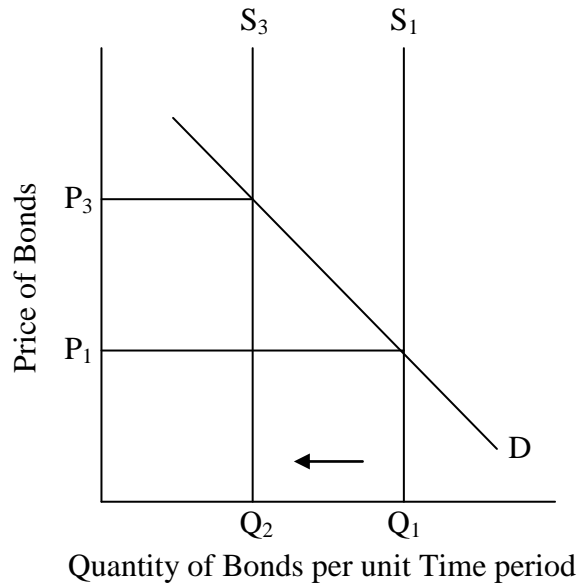
Source: Roger Le Miller- Previous reference.

In figure (2/1), the Central Bank offers more bonds for sale. The price drop from (P_1) to (P_2). In figure (2/2) the Central Bank purchases bonds. The price of bonds must rise from (P_1) to (P_3) to clear the market.

b) Reserve Requirement:

The Central Bank requires banks to hold a fraction of their transaction deposits as reserves .This fraction is the reserve requirement .Large banks hold a greater percentage of deposits in reserve than small banks . Required reserves are the dollar amount of reserves that a bank must hold to meet its reserve requirement. Which tells banks how much of their money they must have on reserve each night. If it weren't for the reserve requirement, banks would lend 100% of the money people have deposited. No one needs all their money each day. So it is safe for the banks to lend most of it out. However Central Bank, on average keep 10% of money deposited as reserve. The way they have enough cash on hand to meet most demand for redemption. When the central bank wants to restrict liquidity it raises reserve requirement and inverse is true.

There are two ways in which required reserves may be held : vault cash at the bank or deposit in the central bank. The sum of a bank's vault cash (coin and currency in the bank's vault) and its deposit in the central bank is called its legal reserves . When legal reserves equal required reserves , the bank has no excess reserves and can make no new loans. When legal reserves exceed required reserves, the bank has excess reserves available for lending . A bank excess reserves changes , the lending and money – creating potential of the banking system changes. [1]

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1) Roger Le Roy Miller – previous reference – P. 371.

One way in which the Central Bank can alter excess reserves is by changing the reserve requirement. If it lowers the reserve requirement, a portion of required reserve becomes excess reserve, which can be used to make loans and expand money supply. By raising the reserve requirement, the Central Bank reduces money – creation potential of the banking system and tend to reduce money supply.

c) Discount Rate (Discount window):

Discount window is the facility at which banks can borrow reserves from the central bank .If a bank need more reserves in order to make new loans , it typically borrows from other banks in the Federal Funds market. When a bank borrows from the Federal Funds market, it pays a rate of interest called the federal fund rate .

At times , however, banks borrow directly from the central bank . The discount rate is the rate of interest that Central Bank charges banks . Another way in which the central bank controls the level of bank reserves and money supply is by charging the discount rate.

When the central bank raises the discount rate, it raises the cost of borrowing reserves, reducing the amount of reserves borrowed. Lowering levels of reserves limit bank lending and the expansion of money supply .When the central bank lowers the discount rates , it lowers the cost of borrowing reserves, increasing the amount of borrowing. As bank reserves increases , so do loans and money supply . The Central Bank discount loans to banks are of three types: [1]

- **Primary Credit:**

Primary credit is the discount lending that plays the most important role in monetary policy. The rate on primary credit is for loans made to banks that are in

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1) Michael Melvin and William Boyes – previous reference – P. 300.

good financial condition. Healthy banks are allowed to borrow all they want at very short maturities (usually overnight) from the primary credit facility and it is therefore referred to as a standing lending facility .

The interest rate on these loans is the discount rate, it is set higher than the federal funds rate target. Because the central bank prefers that banks borrow from each other in the federal funds market so that they continually monitor each other for credit risk. As a result, in most circumstances the amount of discount lending under the primary credit facility is very small.

- **Secondary Credit:**

    Secondary credit is given to banks that are in finical trouble and are experiencing server liquidity problems. The interest rate is set at 50 basis points (0.5 per cent point) above the discount rate. The interest rate on these loans is set at a higher penalty to reflect the less-sound condition of these borrowers.

- **Seasonal Credit:**

    Seasonal credit is given to meet the needs of a limited number of small banks in vacation and agricultural areas that have a seasonal pattern of deposits. The interest charged on seasonal credit is tied to the average of the federal funds rate and certificate of deposits rated.

    Discounting is particularly an effective way to provide reserves to the banking system during a banking crisis because reserves are immediately channeled to the banks that need them most. [1]

The Central Bank has used its discount lending weapon several times to avoid bank panics by extending loans to troubled banking institutions, thereby preventing further bank failures.

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1) Roger Le Roy Miller – previous reference – P. 372.

d) Interest on Reserve:

This tool of monetary policy does not have a long history, because the Federal Reserve started paying interest on reserve only in 2008. For the same reason the Federal reserve sets discount rate above the federal funds target , that is to encourage borrowing and lending in the Federal Funds market, so that banks monitor each other. The Federal reserve generally has set the interest rate on reserve below the Federal Funds target. This means that, the Federal reserve has not yet used interest on reserve as a tool of monetary policy, but instead has just used it to help provide a floor under the Federal Funds rate. [1]

Relative Advantages of Different Tools:

Open market operations constitute the most important conventional monetary policy tool because they have four basic advantages over the other tools:

1. Open market operations occur at the initiative of the Federal reserve, which has complete control over their volume. This control is not found, for example, in discount operations, in which the Federal reserve can encourage or discourage banks to borrow reserves by altering the discount rate but cannot directly control the volume of borrowed reserves.

2. Open market operations are flexible and precise , they can be used to any extent. No matter how small a change in reserves or the monetary base is desired. Open market operations can achieve it with a small purchase or sale of securities. Conversely, if the desired change in reserves or the monetary base is very large, open market operations tool is strong enough to do the job through a very large purchase or sale of securities.

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1) Roger Le Roy Miller – previous reference – P. 371.

3. Open market operations are easily revised. If a mistake is made in conducting an open market operations, the Federal Reserve can immediately reverse it. If the trading desk decides that the Federal Funds rate is too low because it has made too many open market purchases, it can immediately make correction by conduction market sales.

4. Open market operations can be implemented quickly they involve no administrative delays. When the trading desk decide that it wants to change the monetary base or reserves, it just places orders with security dealers and trade is executed immediately change to reserve requirements, on the other hand, it takes time to implement because banks must be given advance warning to calculate required reserves, this is costly. Reversing a change in reserve requirements would be burdensome to banks. For these reasons, the policy tool of changing reserve requirements does not have much to recommend it, and it is rarely used.

There are two situations in which the other tools have advantages over open market operations. One is when the Federal Reserve wants to raise interest rates after banks have accumulated large amount of excess reserves. The second is when discount policy can be used by the Federal Reserve to perform its role of lender of last resort.

(2/3/2) Non-Conventional Monetary Policy Tools:

Central banks uses them during the financial crisis. In normal times, conventional monetary policy tools which expand money supply and lower interest rates are enough to stabilized the economy. When the economy experiences a full-scale financial crisis, conventional monetary policy tools cannot do the job for two reasons. First: The financial system seizes up to an extent that it becomes unable to allocate capital to productive uses and so investment spending

and the economy collapse. Second: The negative shock to the economy can lead to the zero-lower-bound problem, in which the Central Bank is unable to lower short-term interest rates further because they have hit a floor of zero, as occurred at the end of 2008. The zero-lower-bound problem occurs because people can always earn more from holding bonds than holding cash and therefore nominal interest rates cannot be negative. For both these reasons, Central Banks need non-interest-rate to stimulate the economy which are non-conventional tools.

The non-conventional tools are as follows:

a) Liquidity Provision:

Although conventional monetary policy actions were not sufficient to heal the financial market and contain the financial crisis, the Federal Reserve implemented unprecedented increases in its lending facilities to provide liquidity to financial market which are:

1. Discount window expansion:

Discount window expansion in which the Federal Reserve lowered the discount rate (the interest rate on loans it makes to bank) above the Federal Funds rate target.

2. Term auction facilities:

Term auction facilities to encourage additional borrowing. In which the Federal Reserve made loans at a rate determined through competitive auctions.

3. New lending programs:

The Federal Broad ended its provision of liquidity to the financial system well beyond its traditional lending to banking institutions.

b) Asset Purchases.

(c) Commitment to future policy action:

Although short-term interest rates couldn't be driven below zero after the global financial crisis, the Federal reserve could take another route to lower long-term interest rate. The route involved a commitment by the Federal reserve to keep the federal funds rate at zero for a long period of time. The long-term interest rates will be equal to an average of the short-term interest rates that market expected to occur over the life of the long-term bond. By committing to the future policy action of keeping federal funds rate at zero for extended period, the Federal fund could lower the markets' expectations of future short-term interest rates, thereby causing the long-term interest rate to fall. This is referred to such strategy as management of expectations.

(2/4) Theories of Monetary Policy:

(2/4/1) The Keynesian View of The Role of Money:

The Demand for Money:

In this theory of demand for money, which he called the liquidity preference theory, Keynes in his book "The General Theory of Employment , Interest, and Money"-1936, gave three important motives of demand for money: the transactions motive, the precautionary motive, and the speculative motive.

- **Transactions Motive:**

The first motive to hold money is the transactions demand. Transactions demand for money is the stock of money people hold to pay everyday predictable expenses. To make quick and easy purchases is the main reason for holding money. [1]

Keynes initially accepted the quantity theory view that transactions component is proportional to income. Later, he recognized that payment technology (eg:

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1) Irvin B. Tucher, previous reference, P. 692 – 693

Credit Card) could a affect the demand for money. As payment technology advances, demand for money would likely to decline relative to income.

- **Precautionary Motive:**
Precautionary demand for money is the stocks of money people hold to pay unpredictable expenses. This is the "mattress money" people hold to guard against those unexpected payment. Because of unforeseen events that can prevent people from paying their bills on time, people hold precautionary balance. Keynes argued that the precautionary money balances people want to hold would be proportional to income.

- **Speculative Motive:**
Speculative demand for money is the stock of money people hold to take advantage of expected future changes in the price of bonds, stocks or other non-monetary financial assets. Individuals and business demand money to speculate or guess , where the prices of alternative assets will rise or fall .This desire to make advantage of profit – making opportunities when the prices of non money assets fall is the driving force behind the speculative demand.

(2/4/2) Money Demand Function:

People hold money in order to: (1) carry out transactions , (2)be prepared for emergencies ,and (3) speculative on purchases of various assets. Interest rate and nominal income influence how much money people hold in order to carry out these three activities. [1]

- **The Interest Rate:**

There is an inverse relationship between the interest rate and the quantity of money demanded . The interest rate is the opportunity cost of holding money .The higher the rate of interest , the greater the interest forgone by holding money ,so the less money hold .Some component of money supply pay interest to depositors.

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1) Irvin B. Tucher, previous reference, P. 692 – 693

Here the opportunity cost of holding money is the difference between the interest rate on bonds or some other non monetary assets and the interest rate on money.

- **Nominal Income:**

The demand for money depends on nominal income . Money demand varies directly with nominal income because as income increases ,more transactions are carried out and more money required for those transactions . If the prices of all goods increase , then more money must be used to purchase goods and services. And as real income increases , more goods and services are being demanded to execute the higher level of transactions.

Demand for money curve represents the quantity of money people hold at different possible interest rates. As shown in figure (2/3), people increase their money balance when interest rates fall. There is an inverse relationship between the quantity of money demand and the interest rate.

Assume that the level of real (GDP) is $ 5000 billion. Assume households and business demand to 10% of real (GDP) ($500 billion) for transactions and precautionary balances. The speculative demand for money varies inversely with the interest rate.

Figure (2/3): The Demand for Money Curve
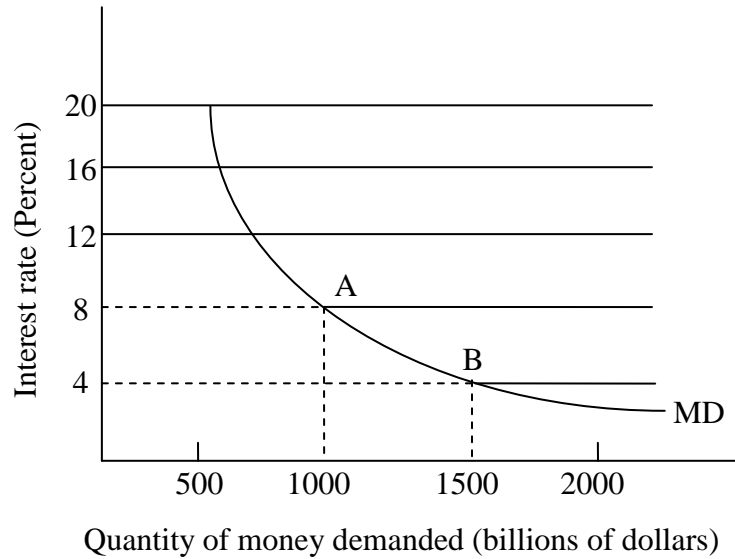
Source: , Irvin B-Tucker – previous reference .

Money demanded is a negative function of the interest rate .At interest rate of 8 percent, the quantity of money demanded (M_1) is \$1000 billion point (A), calculated as the sum of transactions precautionary demand (\$500 billion) and speculative demand (\$500 billion). At a lower interest rate, a greater total quantity of money demand because the opportunity cost of holding money is lower.

Keynes liquidity preference function is written as follows:

$$\frac{M^d}{P} = L\,(i_-, Y_+) \underline{\hspace{3cm}} (1)$$

Whereas:

M d :Money demanded.

P :Price level .

L: Liquidity of money .

i: Nominal interest rate.

Y: Real income.

Keynesian theory of money demand says that "demand for real money balance is negatively related to the nominal interest rate (i) and is positively related to real income (Y)".

An important implication of Keynesian theory of money demand is that velocity is not constant but will fluctuate with changes in interest rates. To illustrate, the liquidity preference function which is written as follows:

$$\frac{P}{M^d} = \frac{1}{L(i,Y)} \rightarrow Multiply\ by\ (Y) _____ (2)$$

$$V = \frac{PY}{M} = \frac{Y}{L(i,Y)} _____ (3)$$

Whereas:

V : Velocity of money.

When(i) goes up, L (i, y) declines and therefore velocity rises.

(2/4/3) The Quantity Theory of Money:

Developed by the classical economists in the nineteenth and early twentieth century, the quantity theory of money is a theory of how the nominal value of aggregate income is determined. Because it also tells how much money is held for a given amount of aggregate income, it is a theory of the demand for money. The most important feature of this theory is that it suggests that interest rates have no effect on demand for money

The equation of exchange is converted from an identity to a theory by making certain assumptions. The classical economics become the forerunners of modern-day monetarist by arguing that the velocity of money (V) and real output (Q) are fairly constant. [1]

The classical economists viewed that(V) is constant because people's custom is to hold a certain quantity of money, and therefore, the number of times a dollar spent, is slow to change. The classical economics believed in price and wages flexibility. They believed that the economy would automatically adjust to long-run full-employment output (Q). They believed the quantity theory of money states that "changes in money supply are directly related to changes in the price level". Monetary policy based on the quantity theory of money therefore directly affects price level. To illustrate the equation of exchange will be modified by putting a bar (-) over (Q) and (V) to indicate they are constant:

$$M \; x \; \bar{V} = P \; x \; \bar{Q} \; \rule{3cm}{0.4pt} \; (4)$$

Whereas:

$Q \equiv$ Output .

$V \equiv$ Velocity.

$M \equiv$ Money demand.

$P \equiv$ Price level.

1) Irvin B. Tucher, previous reference, P. 702

(2/4/3/a) Quantity Theory and Price Level:

Because the classical economists (including Fisher) thought that wages and prices were completely flexible, they believed that the level of aggregate output (Y) produced in the economy during normal times would remain constant at full-employment level, so (Y) in the equation of exchange could also be treated as reasonably constant in the short run (Y^-).

$$P = \frac{M \times V^-}{Y^-} \underline{\hspace{4cm}} (5)$$

The equation implies that if (M) doubles, (P) must also double in the short-run because (V^-) and (Y^-) are constant. Classical economists explain movement in the price level. Changes in the quantity of money lead to proportional changes in the price level. [1]

(2/4/3/b) Quantity Theory and Inflation:

The quantity theory of money is transformed into a theory of inflation. The mathematical fact which states "The percentage change (%Δ) of a product of two variables is approximately equal to the sum of the percentage changes of each of these variable".

$$\%\Delta\ (P \times Y) = \%\Delta P + \%\Delta Y \underline{\hspace{3cm}} (6)$$

Using this mathematical fact, the equation will be rewritten as follows:

$$\%\Delta\ M + \%\ \Delta V = \%\Delta P + \%\Delta Y \underline{\hspace{3cm}} (7)$$

Subtracting $(\%\Delta Y)$ from both sides of equation (7):

$$\%\Delta P = \%\Delta\ M + \%\ \Delta V - \%\ \Delta Y \underline{\hspace{3cm}} (8)$$

The inflation rate (π) is the growth rate of price level $(\%\Delta P)$.

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1) Irvin B. Tucher, previous reference, P. 702

$$\pi = \%\Delta P = \%\Delta M + \%\Delta V - \%\Delta Y \underline{\hspace{3cm}} (9)$$

Since the velocity is constant, the growth rate is zero, so the quantity theory of money is also a theory of inflation:

$$\pi = \%\Delta M - \%\Delta Y \underline{\hspace{3cm}} (10)$$

The quantity theory of inflation indicates that the inflation rate equal the growth rate of money supply minus the growth rate of aggregate output. [1]

(2/4/4) Velocity of Money and Equation of Exchange:

This theory examines the link between the total quantity of money(M) (money supply) and total amount of spending of final goods and services produced in the economy $(P_x Y)$. The concept that provides the link between (M) and $(P_x Y)$ is called *the* velocity of money.

Velocity of money (V) is the average number of times per year (turnover) that dollar of money supply spent on final goods and services produced in the economy. Velocity is defined more precisely as total spending $(P_x Y)$ divided by the quantity of money (M).

$$V = \frac{P_x Y}{M} \underline{\hspace{3cm}} (11)$$

The equation of exchange is obtained by multiplying both sides of equation (11) by (M).

$$M \ x \ V = P_x Y \underline{\hspace{3cm}} (12)$$

The equation of exchange is an accounting identity which states that "the quantity of money multiplied by the number of times that money is spent in a given

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1) Irvin B. Tucher, previous reference, P. 703

year must be equal to nominal income (the total nominal amount spent on goods and services in that year)". The equation of exchange does not tell us, that when money supply (M) changes, nominal income (P_xY) changes in the same direction, a rise in (M), for example, could be offset by a fall in (V) that leaves (P_xY) and therefore (P_xY) unchanged.

Another way of interpreting Fisher's Quantity Theory is in term of the demand for money, the quantity of money people need to hold. To illustrate, let's divide both sides of equation of exchange by (V) to yield the following equation :

$$M = \frac{1}{V} \; x \; PY \; \underline{\hspace{3cm}} \; (13)$$

When money market is in equilibrium, money supply equals to money demand, by replacing (M) by (M^d). In the quantity theory of money, velocity is assumed to be constant, we can replace $\left(\frac{1}{v}\right)$ with a constant (k). The equation can be rewritten as:

$$M^d = k \; x \; PY \; \underline{\hspace{3cm}} \; (14)$$

The equation tell us that because (k) is constant, the level of transactions generated by a fixed level of nominal income (PY) determines the quantity of money (M^d) that people demand. [1]

(2/4/5) Modern Monetarism:

Today's monetarists have changed the assumptions of the classical quantity theory of money. The evidence indicates that velocity is not constant and the economy does not always operate at full- employment. Although (M) and (P) are correlated, they don't change proportionally. Monetarists argue that although

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1) Irvin B. Tucher, previous reference, P. 704

velocity is not unchanging, it is nevertheless predictable. If the economy is far below full employment ,most of the rise in total spending will be in real output .If the economy is near full employment , much of the increase will be in rising prices.

Monetarists refuse the Keynesian view that the rate of interest is so important . Instead, the monetarists view often express that "money does matter". Instead of working through the rate of interest to affect investment and, in turn , the economy, changes in money supply directly determine economic performance.

The critical question in the Keynesians –Monetarisms debate is that: is the velocity of money stable or predictable?. Keynesians do not accept the monetarists' argument that over long time velocity is stable and predictable . Hence, a change in money supply can lead to a larger or smaller change in (GDP) than monetarists would predict . [1]

Keynesians focused on short – run variations in (V) that accompany any long –run velocity growth rate . They argue that , suppose money supply increases at a constant rate, but velocity is greater than expected . This means that total spending (aggregate demand) will be greater than predicted one causing inflation . Lower than predicted velocity result in unemployment because total spending is less –than expected , which causes the economy to expand too little .The Keynesians believed that the money authority must be free to change the money supply to offset unexpected changes in velocity . Monetarists counter that the Central Bank cannot predict short- run variations in (V) , so its" quick –fix" changes in money supply will often be wrong .This is why monetarists advocate that the Federal reserve follow monetary rule . Keynesians are willing to accept occasional policy errors and reject this idea in favor of maintaining Federal reserve

1) Irvin B. Tucher, previous reference, P. 704

flexibility to change money supply in order to affect interest rates , aggregate demand , and the economy as a whole.

(2/4/6) The New Classical Theory:

In the 1970s an alternative to Keynesian and Monetarist economics developed new classical economics in response to the problems of meeting economic policy goals. [1]

Classical economics is the theory that was popular before Keynes changed the face of economics in the 1930s . According to classical economics, real (GDP) is determined by aggregate supply , while equilibrium price level is determined by aggregate demand .The vertical aggregate supply curve mean that the equilibrium level of output (income) is the only product of the determinants of aggregate supply : the price of resources , technology , and expectations .

New classical economics questioned some assumptions on which Keynesian economics was based .For instance, new classical economics believed that wages are flexible , while the Keynesian assumed that wages can be fixed in the short run. New classical does not assume that people know everything that is happening as the old theories did .People make mistakes because their expectations of prices or other critical variable are different from future reality .New classical economics emphasize rational expectations . Tradeoffs, expectations ,credibility, and sources of business cycles ,rational expectations are based on all available relevant information. This is a new way of thinking about expectations .Earlier theories assumed that people formed adaptive expectations which were based on their past experience. With rational expectations, people learn not only from their past experience, but also from any other information that helps them predict the future.

1) Frederic S. Mishkin , previous reference, p 130.

Another element of new classical economics is the belief that markets are in equilibrium . Keynesian economics argues that disequilibrium in markets demands government intervention . Keynesian economics defines recession as a disequilibrium in the labor market, a surplus of labor, that requires expansionary government policy . New classical economists believe that because real wages are lower during recession, people are more willing to substitute non labor activities for work . As the economy recovers and wages go up ,people manage to move away from non -labor activities toward more working hours. They substitute labor for leisure and leisure for labor, over time, they suggest that much of observed unemployment is voluntary in the sense that those who are unemployed choose not to take a job at a wage below their reservation wages. Also ,New classical emphasized expectations . Its basic tent is that changes in monetary policy can change the equilibrium level of real (GDP) only if those changes are unexpected.

(2/4/7) Portfolio Theories of Money Demand:

Related to Keynes's analysis of demand for money are called Portfolio theories of money demand, in which people decide how much of an asset such as money want to hold as part of their overall portfolio assets.

The theory of portfolio choice states that "the demand for an asset is positively related to wealth, expected return relative to other assets and relative to liquidity, where as it is negatively related to its risk compared to other assets. [1]

This theory of portfolio choice can justify the conclusion from the Keynesian liquidity preference function that demand for real money balances is positively related to income and negatively related to the nominal interest rate.

Because income and wealth tend to move together, when income is higher, wealth is likely to be higher as well. Hence, higher income means that wealth is

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1) Frederic S. Mishkin , previous reference, p 130.

higher and the theory of portfolio indicates that demand for money assets will rise and the demand for real money balances will be higher.

As interest rates rise, the expected return for money does not change. However the return for bonds, on alternative asset, goes up. Thus although the expected absolute return of money didn't change, money's expected return relative to bonds went down. In others words as the theory of portfolio choice indicate higher interest rates making money less desirable, and the demand for real money balances falls. Holding all the factors constant, the portfolio theory indicates that:

1. The quantity demanded of an asset is positively related to wealth.
2. The quantity demanded of an asset is positively related to its expected return compared to alternative assets.
3. The quantity demanded of an asset is negatively related to the risk of its return compared to alternative assets.
4. The quantity demanded of an asset is positively related to its liquidity compared to alternative assets.

- These results are summarize in table (2/1) below:

Table (2/1): Response of the Quantity of an Asset Demanded to Change in Wealth, Expected Returns, Risk and Liquidity

Variable	Changing variable	Change in quantity demanded
1. Wealth	↑	↑
2. Expected return relative to other assets	↑	↑
3. Risk relative to other assets	↑	↓
4. Liquidity relative to other assets	↑	↑

Source: Fredric Mishkin, previous reference.

Whereas:

↑ ≡ Stands for increase   ↓ ≡ Stands for decrease

The analysis of the demand for money using Keynesian and portfolio theories indicates that, six factors affect demand for money: interest rates, income, payment technology, wealth, riskiness of other assets, inflation risk and liquidity of other assets. This summarized in table (2/2) below:

Table (2/2): Factors that Determine Demand for Money

Variable	Change in variable	Money demand response	Reason
1. Interest rates	↑	↓	Opportunity cost of money rises.
2. Income	↑	↑	Higher transactions.
3. Payment technology	↑	↓	Less need for money in transactions.
4. Wealth	↑	↑	More resources to put into money
5. Risk of other assets	↑	↑	Money relatively less risky and so more desirable.
6. Inflation risk	↑	↓	Money relatively more risky and so less desirable

Source: Fredric S. Mishkin, previous reference.

Whereas:

↑ ≡ Stands for increase

↓ ≡ Stands for decrease

(2/5) Supply of Money:

The quantity of money that is available for spending is an important determinant of many key macroeconomic variables, since changes in the money supply affect interest rate , inflation , and indicators of economic growth . When economists measure the money supply , they measure spendable assets. Identifying those assets , however, can be difficult. Although it would seem that all bank deposits are money , some bank deposits are held for spending , while others are held for saving. In defining money supply , economists must differentiate between assets on the basis of their liquidity and the likelihood of their being used for spending.

The problem of distinguishing among assets has produced more than one definition of money supply. Today the economists use (M1) and (M2). Economists and policymakers used both definitions to evaluate the availability of funds for spending . Although economists have tried to identify a single measure that best influences the business cycle and changes in interest rates and inflation .

(2/5/1) (M1) Money Supply:

The narrowest and most liquid measure of money supply is (M1), or financial assets that are immediately available for spending .This money definition measures purchasing power immediately available to the public without borrowing or give notes .Specifically , (M1) measure the currency , traveler's checks, and checkable deposits held by the public at a given time. (M1) does not include the money held by the government , Federal reserve banks ,or depository institutions.[1]
 (M1) can be shown in the following formula:
 M1= Currency + checkable deposits

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1) Michael Melvin and William Boyes , previous reference, p 268.

- **Currency:** Currency include coins and paper money ,officially called Federal Reserve notes, that public holds for immediate spending .The purpose of currency is to enable people to make small purchases .

- **Checkable Deposits (Demand Deposits):** Checkable deposits are the total of checking account balances in financial institutions that are convertible to currency "on demand" by writing a check without advancing notes. A checking account balance is bookkeeping entry , often called demand deposit because it can be converted into cash "on demand". Before the 1980s, only commercial banks could legally provide demand deposits . Today, checking accounts are available in different financial institutions .

(2/5/2) (M2) Money Supply:

M2 is a broader measure of money supply that includes assets in somewhat less liquid form . (M2) money supply includes (M1) money supply plus saving deposits, small time deposits , and balances in retail money market mutual funds. (M2) can be written in a formula as follows:

M2 = M1 +near money.

Which also can be rewritten as :

M2 = M1+ Saving deposits +Small time deposits

- **Saving Deposits** :

Saving deposits are interest –bearing accounts that can be withdrawn. These deposits include passbook savings accounts, money market mutual funds , and other types of interest –bearing deposits with commercial banks , savings and loan associations , and credit unions , that earn interest but offer no check- writing privileges. [1]

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1) Michael Melvin and William Boyes , previous reference, p 268.

- **Small Time Deposits:**

A time deposit is an interest- bearing account in a financial institution that requires a withdrawal notes or must remain on deposit for a specific period unless early withdrawal penalty is paid. Time deposit is always less than $100000. It is often called certificates of deposit.

- **Retail Money Market Mutual Fund:**

  Retail money market mutual fund combines the deposits of many individuals and invest them in government Treasury bills and other short- term securities . Many money market mutual funds grant check- writing privileges but limit the size and number of checks. [1]

(2/5/3) Money Supply Function:

The Central Bank is responsible for money supply . The fact that , the Central Bank can choose money supply means that money supply function is independent of the current interest rate and income .Figure (2/4) , illustrates money supply function (Ms) . In figure (2/4), money supply is $600 billion at all interest rate level . If the central bank increase money supply , the vertical money supply curve shifts to the right . If it decreases money supply the curve shifts to the left. [2]

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1) Michael Melvin and William Boyes , previous reference, p 269.
2) Frederic S. Mishkin , previous reference, p 153.

Figure (2/4): Money Supply Function
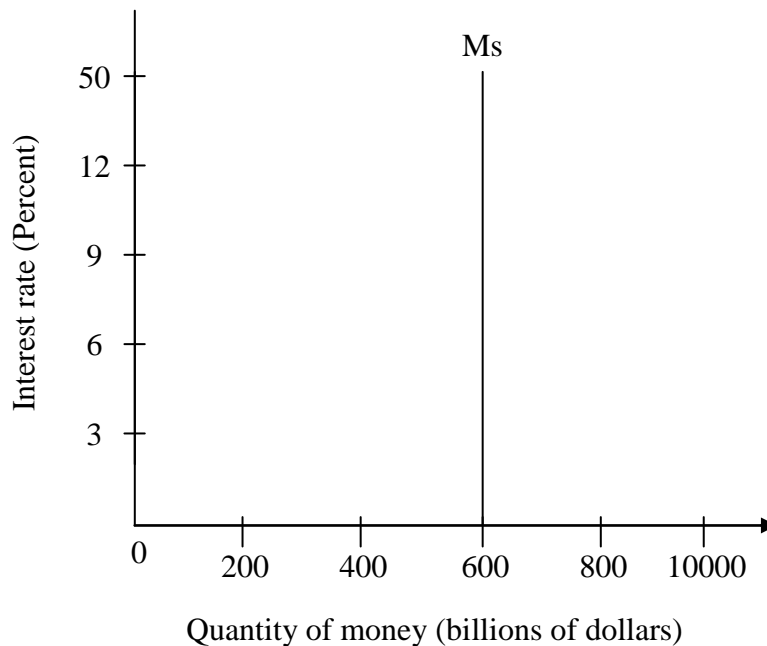
Money supply function (Ms) is a vertical line. This indicates that Central Bank can choose the money it wants, independent of the interest rate and real (GDP). The curve shifts to the right or to the left when money supply increases or decreases.

(2/6) Types of Monetary Policy:

Monetary Policy is referred to either being expansionary or contractionary.

- **Expansionary monetary policy:**

Where policy increases total supply of money in the economy more rapidly than usual. Expansionary policy is traditionally used to try to combat unemployment in recession by lowering interest rate in the hope that easy credit will entice businesses into an interest rates have been low and in many cases near zero.

In figure (2/5), started with equilibrium at (E$_1$), with long-run aggregate supply at (LRAS) and short-run aggregate supply at (SRAS$_1$), and real (GDP) at price

level (P_1). Because of the increase in money supply, aggregate demand(AD_1) shifts outward to the right to (AD_2). At price level (P_1), there is an excess demand for real goods and services equal to the horizontal distance between (A) and (E_1). In the short-run, the excess demand for real output induces a move to point (E_2). The price level rises to(P_2). At an output rate of (Y_2) ,Long-run, expectations are revised upward and input prices are revised accordingly. Therefore, the short-run aggregate supply curve, ($SRAS_1$), begins to shift upward vertically to ($SRAS_2$). Long-run equilibrium occurs at(E_3) and the ultimate effect is a rise in the price level.

Figure (2/5): The Effects of Expansionary Monetary Policy
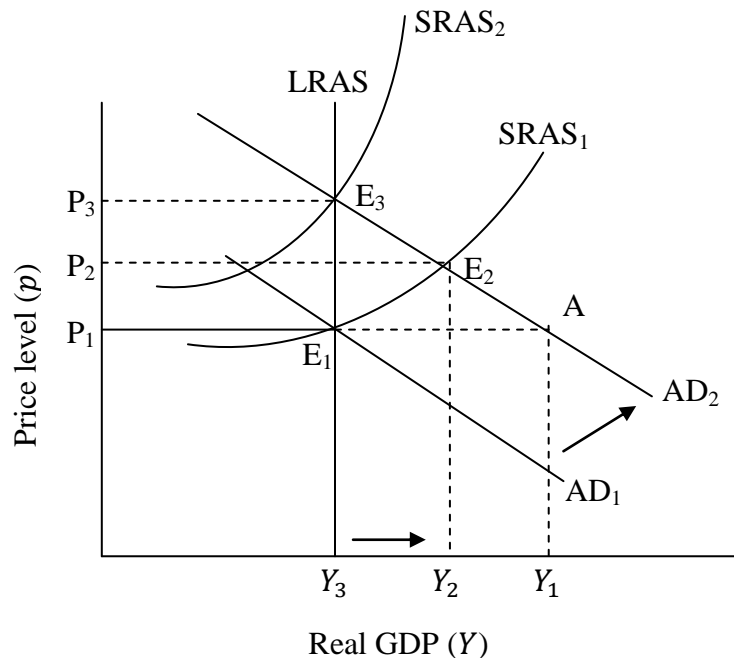
Source: Fredric S. Mishkin, previous reference.

- **Contractionary Monetary Policy:**

Expands money supply more slowly than usual or even shrinks it. When central bank engaged in contractionary monetary policy, it increases its sales of government bonds, so the bond prices fall and raise the interest rate on existing bonds. These bonds sell to banks. The banks purchase the bonds with reserves. [1]

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1) Fredric S. Mishkin , previous reference, p 153.

Figure (2/6): The Effects of Contractionary Monetary Policy
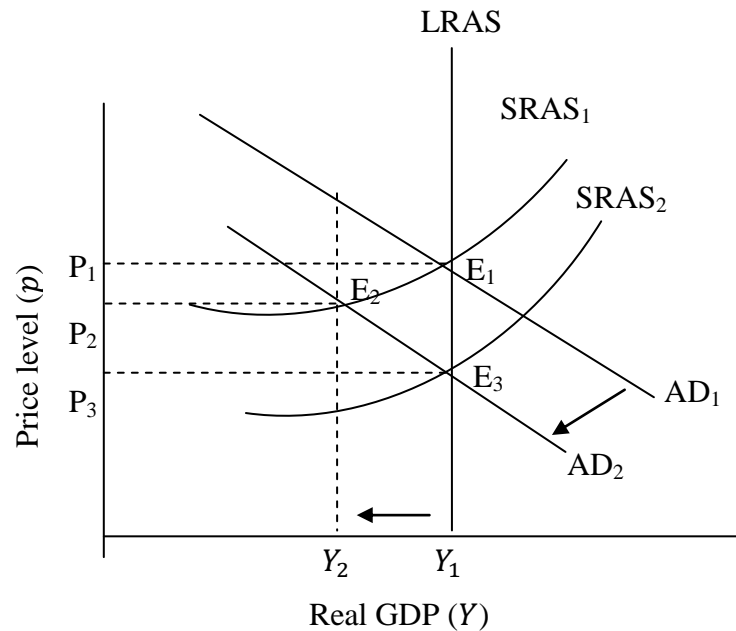
Source: Fredric S. Mishkin, previous reference.

This push banks not being able to meet their reserve requirements and reducing their lending. Therefore, they raises the rate of interest they change on loans. Some borrowers eliminate themselves from the market, some have borrowed. The aggregate demand curve shifts from (AD_1) to (AD_2) in figure (2/6). The initial requirement was at point (E_1) with price level of (P_1) at real (GDP) (Y_1). (AD_1), $(SRAS_1)$, and (LRAS) are intersect at point (E_1). When the central bank sold bonds. The aggregate demand curve shifts to (AD_2). In short-run, movement along $(SRAS_1)$ to point (E_2), at which the price level has dropped to (P_2) and real (GDP) has decrease to (Y_2). In the long-run, in a fully adjusted economy, expectations adjust and so do prices. All of the shock is absorbed in a lower price level as $(SRAS_1)$ moves to $(SRAS_2)$. The new equilibrium is at (E_3), the (GDP) at (Y_1) but at lower price level of (P_3). [1]

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1) Frederic S. Mishkin , previous reference, p 154.

(2/7) Aggregate Demand and Supply Analysis:

Monetary policy is very important, because it touches everyday life by affecting the prices of goods people can buy and the quantity of available jobs. A basic tool, aggregate demand and supply analysis will enable people to study the effects of monetary policy on output and prices. Aggregate demand is the total amount of output demanded at different inflation rates. Aggregate supply is the total amount of output that firms in the economy want to sell at different inflation rates. Equilibrium occurs at the intersection of the aggregate demand and aggregate supply curves. [1]

(2/7/1) Aggregate Demand (AD) :

Aggregate demand is made up of four components which are:

- **Consumption expenditure:** The total demand for consumer goods and services.

- Planned investments spending: The total planned spending by business firms on new machines, factories, and other capital goods, plus planned spending on new houses.

- **Government purchases**: Spending by all levels of government (federal, state and local) on goods and services (paper, clips, computers, computer programming, missiles, government workers and so on).

- **Net exports:** The net foreign spending on domestic goods and services, equal to exports minus imports.

Aggregate demand equation is written as follows:

$$Y^{ad} = C + I + G + NX \ \rule{3cm}{0.4pt} \ (15)$$

Whereas:

Y^{ad}: Total output (GDP).
C: Consumer expenditures.
I: Investment.
G: Government expenditures.
NX: Net exports.

---

1) Frederic S. Mishkin , previous reference, p 270.

Aggregate Demand curve:

Which describes the relationship between the quantity of aggregate output demanded and inflation rate when all other variables are held constant. When the inflation rate rose ($\pi \uparrow$), the monetary authorities will raise the real interest rate ($r \uparrow$) in order to keep inflation from spiraling out of control. Higher interest rates resulting in higher cost of financing purchases of new physical capital make investment less profitable and causes planned investment spending to decline ($I \downarrow$) that cause aggregate demand to fall ($Y_\downarrow^{ad}$). A higher inflation rate leads to lower level of the quantity of aggregate output demanded ($\pi \uparrow \Rightarrow Y_\downarrow^{ad}$), and also the aggregate demand curve slopes down, figure (2/7). This mechanism is written as follows: [1]

$$\pi \uparrow \Rightarrow r \uparrow \Rightarrow I \downarrow \Rightarrow Y_\downarrow^{ad}$$

Figure (2/7) : Left Shift in Aggregate Demand
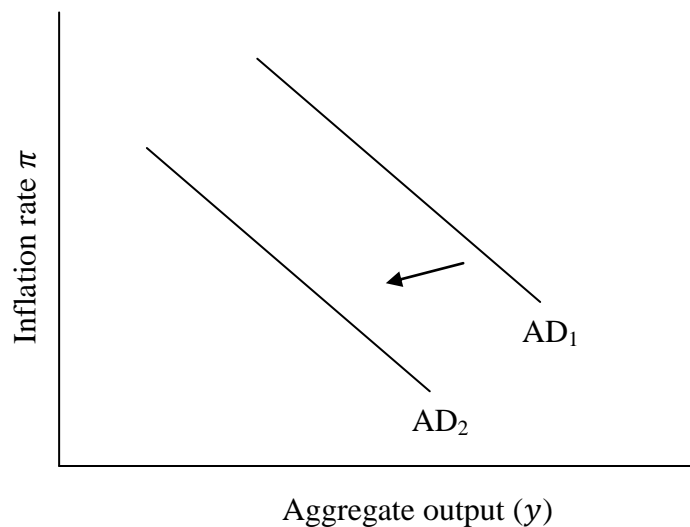
Source: Frederic, Previous Reference.

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1) Frederic S. Mishkin , previous reference, p 584.

The aggregate demand curve shifts to the left from (AD₁) to (AD₂) when there is an autonomous tightening of monetary policy ($r \uparrow$), a decrease in government purchases ($G \downarrow$), an increase in taxes ($T \uparrow$) a decrease in net exports (NX), a decrease in autonomous consumption expenditure ($C \downarrow$).

(2/7/2) Factors Shift the Aggregate Demand Curve:

1. Autonomous Monetary Policy:

When current inflation rises, the central bank will raise the real interest rate to keep inflation from spiraling out of control. When the central bank decides to increase the autonomous component of real interest rate (r), the higher real interest rate at any given inflation rate leads to a higher cost of financing investment project which leads to a decline in investment spending and the quantity of aggregate demand. The curve shift to the left. [1]

$$r \uparrow \Rightarrow I \downarrow \Rightarrow Y_{\downarrow}^{ad}$$

Whereas:

$r \equiv$ Real Interest Rate

$\uparrow \equiv$ Stands for increase

$\downarrow \equiv$ Stands for decrease

2. Government purchase:

An increase in government purchases at any given inflation rate adds directly to aggregate demand expenditure and hence aggregate demand rises.

$$G \uparrow \Rightarrow Y_{\uparrow}^{ad}$$

Aggregate demand rises at any given inflation rate, the demand curve shifts to the right.

---

1) Frederic S. Mishkin , previous reference, p 583.

3. Taxes:

An increase in taxes lower disposable income, which will lead to lower consumption expenditure and aggregate demand, so that aggregate demand falls: so the aggregate demand curve shifts to the left.

$$T \uparrow \Rightarrow C \downarrow \Rightarrow Y_{\downarrow}^{ad}$$

4. Autonomous Net Exports:

An autonomous increase in net exports at any given inflation rate adds directly to aggregate demand and so raises aggregate demand:

$$N X \uparrow \Rightarrow Y_{\uparrow}^{ad}$$

The aggregate demand curve shifts to the right.

5. An autonomous Consumption Expenditure:

When consumption become more optimistic, autonomous consumption expenditure rises and so, they spend more at any given inflation rate. Aggregate demand therefore rises.

$$C \uparrow \Rightarrow Y_{\uparrow}^{ad}$$

The aggregate demand curve shifts to the right.

6. Autonomous Investment:

When business become more optimistic, autonomous investment rises and they spend more at any given inflation rate. Planned investment increases and aggregate demand rises.

$$I \uparrow \Rightarrow Y_{\uparrow}^{ad}$$

The aggregate demand curve shifts to the right. [1]

---

1) Frederic S. Mishkin , previous reference, p 583.

7. Financial Frictions:

The real cost of borrowing reflects not only the real interest rate on default – free debt instruments (r), but also, denoted by (F), which are additions to the real cost of borrowing because of asymmetric information problems in financial markets. When financial frictions increase the real cost of borrowing increases, so that planned investment spending falls at any given inflation rate and aggregate demand falls.

$$F \uparrow \Rightarrow Y_\downarrow^{ad}$$

F: Financial Friction

So the aggregate demand curve shifts to the left.
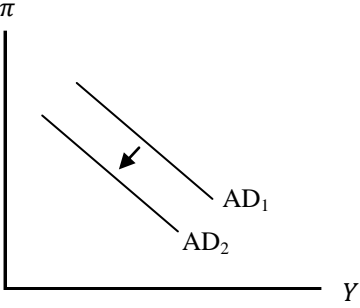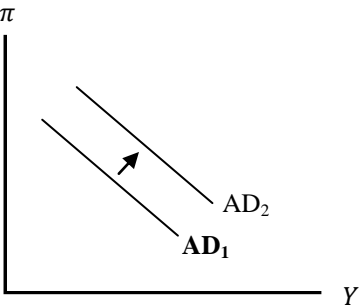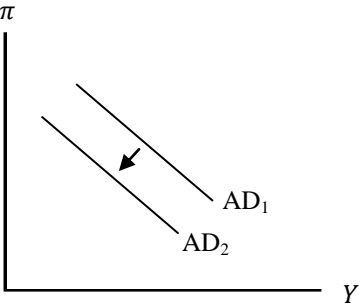
The effects of these factors on aggregate demand curve, shown in Figure (2/3). Conversely the aggregate demand curve shifts to the left when any of these factors change in the opposite direction. [1]

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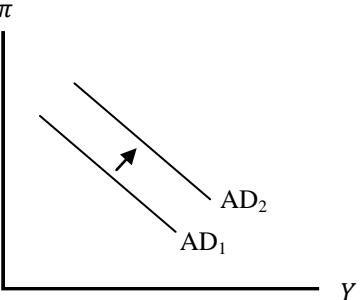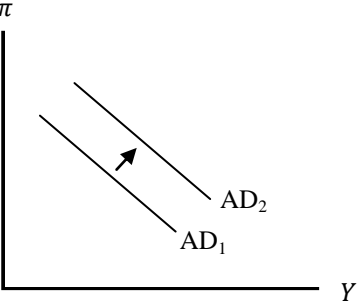
1) Frederic S. Mishkin , previous reference, p 584.

Table (2/3) Summary Table: Factors That Shift The Aggregate Demand Curve

Factors	Change	Shift in aggregate demand curve
1. Autonomous Monetary Policy, r	↑	
2. Government purchases, G	↑	
3. Taxes, T	↑	

Cont: Factors That Shift The Aggregate Demand Curve

4. Autonomous net exports, NX	↑	
5. Autonomous consumption expenditure ,C	↑	
6. Autonomous Investments, I	↑	
7. Financial frictions, F	↑	

Source: Frederic S.Mishkin, Previous Reference.

Whereas:

↑ ≡ Stands for increase.

↓ ≡ Stands for decrease.

- **Note**: Only increase in factors are shown. The effect of decreases in the factors would be the opposite of those indicated in the shift down.

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(2/7/3) Aggregate Supply (AS) :

Aggregate supply curve, describes the relationship between the quantity of output supplies and the price level. Aggregate supply curve differs in short- run and long- run, because prices and wages take time to adjust to their long-run level.

- **Long-Run Aggregate Supply Curve (LRAS) :**

The amount of output that can be produced in the economy in the long-run is determined by the amount of capital in the economy, the amount of labor supplied at full employment and the available technology.

At full employment, unemployment is not at zero, but is rather at level above zero, at which the demand for labor equals to the supply of labor. This natural rate of unemployment is where the economy approaches the long-run. [1]

The level of aggregate output produced at the natural rate of unemployment is called natural rate of output but is referred to as potential output. It is where the economy settles in the long-run for any inflation rate. The long-run aggregate supply curve (LRAS) is vertical at potential output, denoted by (Y^P) as shown below in figure (2/8).

Figure (2/8): Long-Run and Short-Run Aggregate Supply Curve
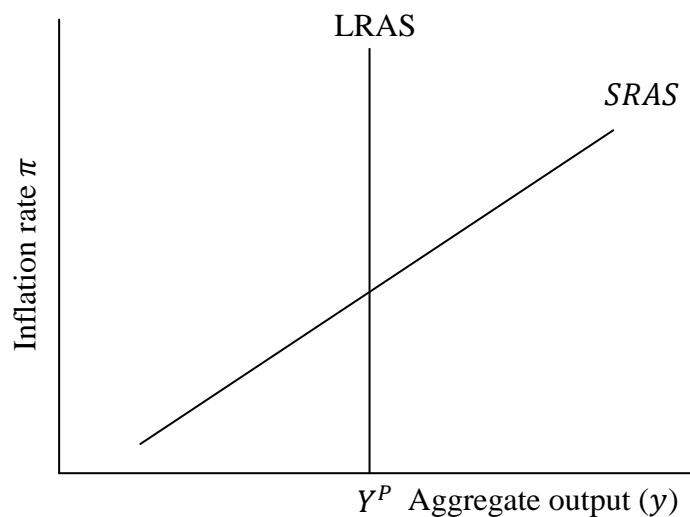
Source: Frederic S.Mishkin, Previous Reference.

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1) Frederic S. Mishkin , previous reference, p 586.

The amount of aggregate output supplied at any given inflation rate is at potential in the long-run, so the aggregate demand curve is a vertical line at(Y^P). The short-run sloping because as(Y) rises relative to (Y^P), labor market get tighter and inflation rises.

- **Short-Run Aggregate Supply Curve (SRAS) :**

The short-run aggregate supply curve is based on intuition that three factors drive inflation:

1. **Expectations of inflation (π^e):**

Workers and firms care about wages in real term that is, in terms of goods and services that wages can buy. When workers expect the price level be rising, they will adjust nominal wages upward.

One-for-one with rise in expected inflation, so that the real wage rate does not decrease. Because wages are the most important cost of producing goods and services, overall inflation will also rise one-for-one with increase in expected inflation. [1]

2. **Output Gap:**

Output gap is defined as the difference between aggregate output and potential output $(Y - Y^p)$. When output exceeds its potential level and the output gap is high, there is very little slack in the economy and workers will demand higher wages and firms will take the opportunity to raise prices. The result will be higher inflation. Conversely, when the output gap is negative, there will be a lot of slack in the economy and workers will accept smaller increases in wages and firms will need to lower prices to sell their goods, resulting in lower inflation. The short-run aggregate supply curve will be upward-sloping, as shown in Figure (2/8), because

1) Frederic S. Mishkin , previous reference, p 587.

the higher output, the greater is the output gap, the less slack in the economy, and the inflation will be high.

3. Price (Supply) Shocks:

Supply shocks occur when there are shocks to the supply of goods and services produced in the economy that can be translated into price shocks, that means shifts in inflation are independent of the amount of slack in the economy or expected inflation. For example, when supply of oil is restricted as has occurred several times when wars have taken place in the Middle East, the resulting rise in the price of the oil led firm to raise prices to reflect increased cost of production, thus driving up inflation. Price shocks could also come from a rise in import prices or from cost-push shocks, in which workers push for wages higher than productivity gains, these by driving up costs and inflation.

Putting all the analysis together result in a short-run aggregate supply equation that can be written as follows :

$$\pi = \pi^e + \gamma \, (Y - Y^p) + P \quad \underline{\hspace{3cm}} \quad (16)$$

$$Inflation = Expected \; Inflation + \gamma \times Output \; gap + Price \; shock$$

$[\gamma \rightarrow$ The sensitivity of inflation to the output gap$]$ [1]

Whereas:

π: Inflation

π^e: Expected inflation

P : Price

γ: The sensitivity of inflation to output gap.

_____

1) Frederic S. Mishkin , previous reference, p 588.

This equation shows that the short-run aggregate supply curve is sloping upward , because of a higher level of output (Y) means that output gap $(Y - Y^P)$, is higher and this produces higher level of inflation.

The short-run aggregate supply in equation (16) implies that wages and prices are sticky, which means that the aggregate price level adjusts slowly over time. The more flexible wages and prices are, the more inflation is respond to deviations of output from potential output. That is more flexible wages and prices imply that the absolute value of (γ) is higher, which implies that the short-run aggregate supply curve is steeper. If wages and prices are completely flexible, then (γ) becomes so large and that the short-run aggregate supply curve is vertical, and it would be identical to the long-run aggregate supply curve.

Shifts in Long-Run Aggregate Supply Curve:

The quantity of output supplies in the long-run is determined by three factors that cause potential output to change and shift the long-run aggregate supply:

- The total amount of capital in the economy.
- The total amount of labor supplies in the economy.
- The available technology.

The long-run aggregate supply curve shifts to the right when there is an increase in the total amount of capital in the economy, an increase in the total amount of labor supplied in the economy, and increase in the available technology. Conversely, when any of these factors change in opposite direction shift the long-run aggregate supply (LRAS) curve to the left as shown below in figure (2/9). [1]
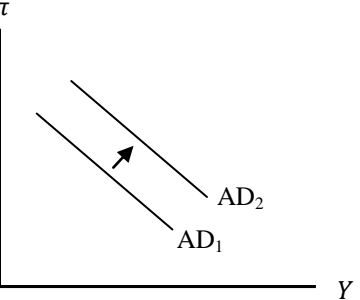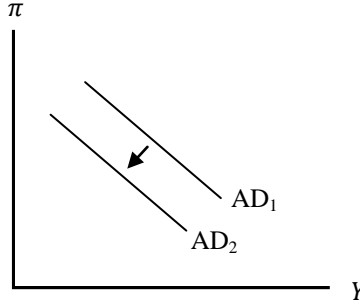
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1) Frederic S. Mishkin , previous reference, p 588.

Figure (2/9): Shift in the Long-Run Aggregate Supply Curve
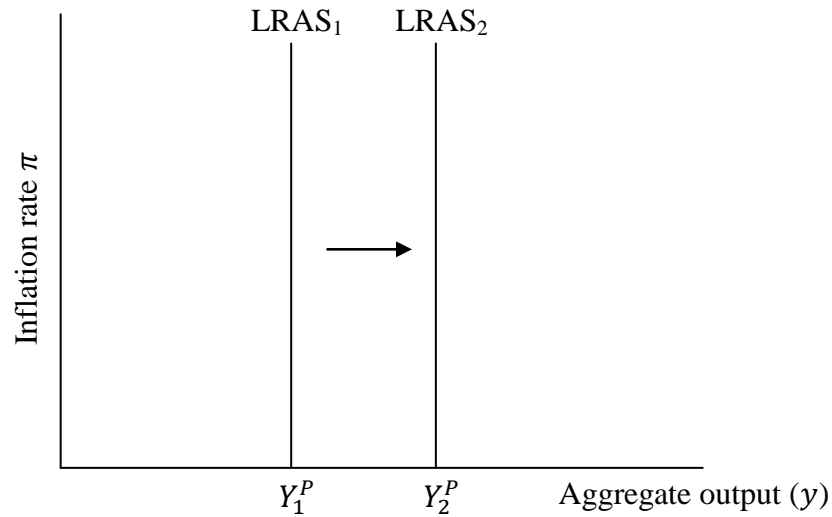
Source: Frederic S.Mishkin, Previous Referenc.

Shifts in Short-Run Aggregate Supply Curve(SRAS):

Three factors can shift the short-run aggregate supply curve, which are:
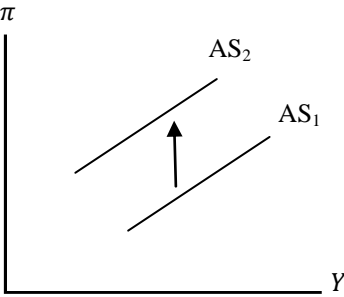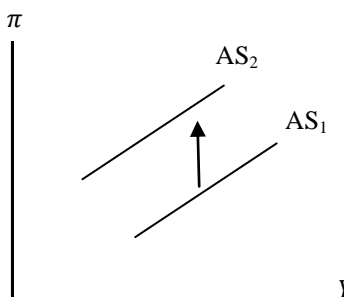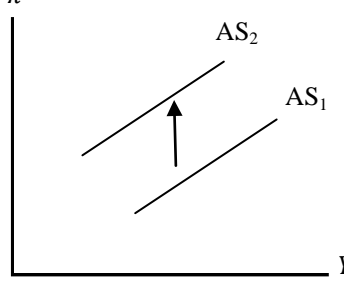
- Expected inflation.
- Price shock.
- Output gap.

A rise in expected inflation cause the short-run aggregate supply curve to shift upward and to the left. The larger the change in expected inflation, the larger the shift. Unfavorable supply shocks that drive up price cause the short-run aggregate supply curve to shift up and to the left. When aggregate output is above potential output, so that a persistent positive output gap exists, the short-run aggregate supply curve shifts up and to the left. Conversely the short-run aggregate curve shifts down and to the right when any of these factors change in the opposite direction. This can be shown in summary table (2/4). [1]

---

1) Frederic S. Mishkin , previous reference, p 588.

Table (2/4): Factors That Shift the Short-Run Aggregate Supply Curve

Factors	Change	Shift in aggregate supply curve
Expected Inflation, π^e	↑	
Price Shock, ↑	↑	
Output gap, $(Y - Y^p)$	↑	

Whereas:

↑ ≡ Stands for increase

↓ ≡ Stands for decrease

- **Note:** Only increases (↑) in the factors are shown. The effect of decreases in the factors would be the opposite of those indicated in the "Shift" column.

(2/8) Equilibrium in Aggregate Demand and Supply Analysis:

The aggregate demand and supply curves can be put together to describe general equilibrium in the economy. When all markets are simultaneously in equilibrium at the point where the quantity of aggregate output demanded equals the quantity of aggregate output supplied. The general equilibrium is represented graphically as the point where the aggregate demand curve intersects the aggregate supply curve.

(2/8/1) Short-Run Equilibrium:

A short run equilibrium in which the quantity of aggregate output equals the quantity of aggregate supply that intersects at point (E) with an equilibrium level of aggregate output at (Y^E) and equilibrium inflation rate at (π^E). This was shown in figure (2/10).

The short-run equilibrium changes over time in response to two situations: When short-run equilibrium output is initially above potential output (the natural rate of output) and when it is initially below potential output. [1]

Figure (2/10): Short-Run Equilibrium
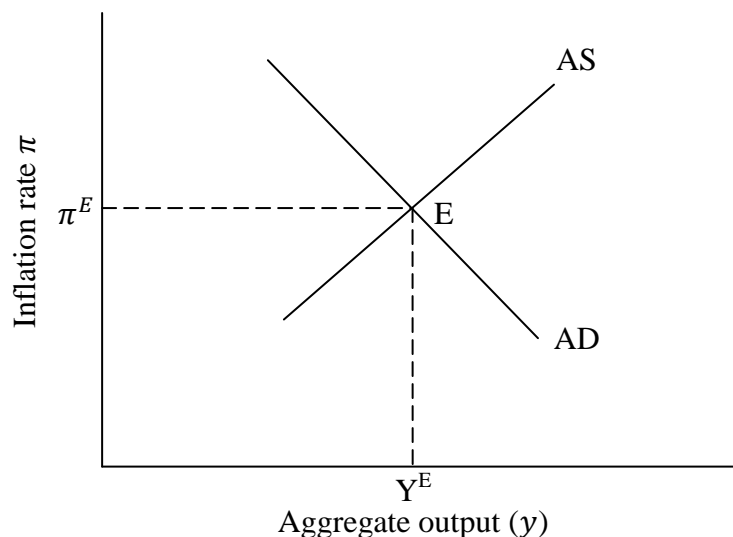
Source: Frederic S. Mishkin, Previous Reference.

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1) Frederic S. Mishkin , previous reference, p 593.

In figure (2/11), the initial equilibrium occurs at point (1), the intersection of the aggregate demand curve (AD) and the initial short-run aggregate supply curve (AS_1). The level of equilibrium output (Y_1), is greater than potential output (Y^P), and there is excessive tightness in the labor market. The positive output gap at $(Y)_1$ drives wages and labor market up. The positive output gap at (Y_1) drives wages up and causes firm to raise prices at a more rapid rate, inflation rise above the initial inflation rate, (π_1). Hence, next period, firms and households adjust their expectations and expected inflation is higher. Wages and prices will then rise more rapidly and the aggregate supply curve shifts up and to the left from (AS_1) to (AS_2).

The new short-run equilibrium at point (2) is a movement up the aggregate demand curve and output falls to (Y_2). Because aggregate output (Y_2) is still above potential output (Y^P), wages and prices increase at an even higher rate, so inflation again rises above its value last period. Expected inflation rises further, eventually shifting the aggregates supply curve up and to the left to (AS_3).

The economy reaches long-run equilibrium at point (3) on the vertical long-run aggregate supply curve (LRAS) at (Y^P). Because output is at potential , there is no further pressure on inflation to rise and no further tendency for the aggregate supply curve to shift.

In figure (2/12), at the equilibrium at point (1), output (Y_1) is below the level of potential output. Because unemployment is now above its natural rate, there is excess slack in the labor markets. This slack at (Y_1) decreases inflation, which decreases expected inflation and shifts the short-run aggregate supply curve in the next point down and to the right to (AS_2). [1]

---

1) Frederic S. Mishkin , previous reference, p 593.

Figure (2/11): Initial Short-Run Equilibrium above Potential Output

LARS

Inflation rate π

AS$_3$
AS$_2$
AS$_1$

π_3 — 3
π_2 — 2
π_1 — 1

AD
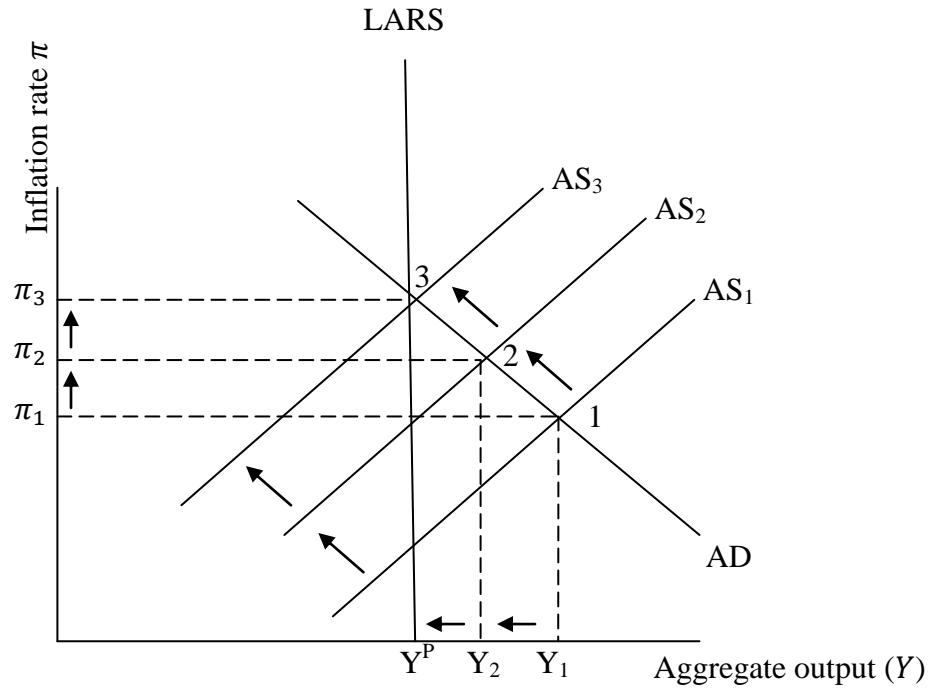
Y^P Y$_2$ Y$_1$ Aggregate output (Y)

Figure (2/12) Initial Short-Run Equilibrium below Potential Output

LARS

Inflation rate π

AS$_1$

AS$_2$

AS$_3$

π_1 — 1
π_2 — 2
π_3 — 3

AD
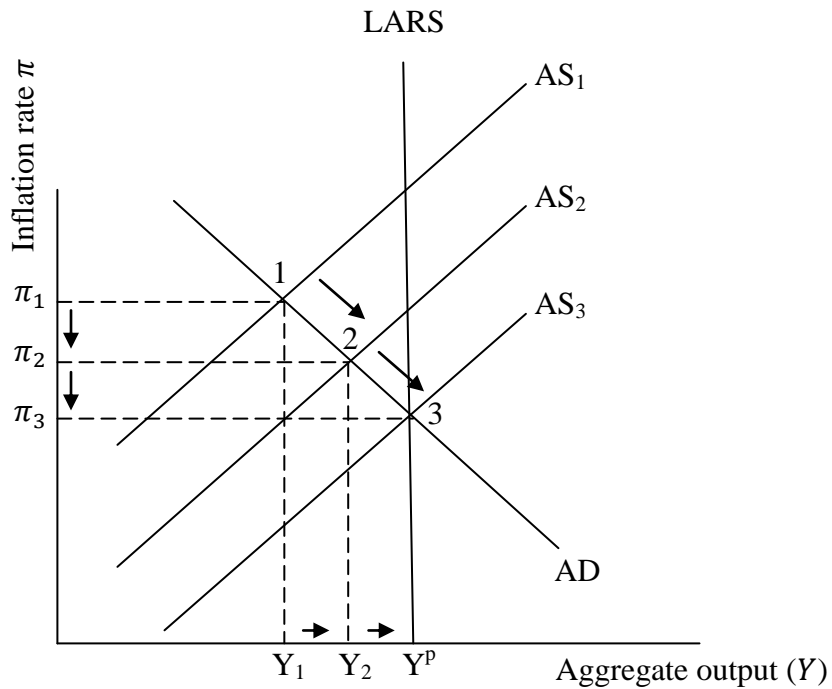
Y$_1$ Y$_2$ Y^p Aggregate output (Y)

However, because aggregate output (Y_2) is still below potential (Y^p) inflation again declines from its value last period , shifting the aggregate supply curve down until it comes to a rest at (AS_3). The economy (equilibrium) moves downward along the aggregate demand curve until it reaches the long-run equilibrium at point (3),the intersect of the aggregate demand curve (AD) and the long-run aggregate supply curve (LRAS) at (Y^p). The economy comes to rest when output has again returned to its potential level.

In these two situation, regardless of where output is initial, it returns eventually to potential output. This called the self-correction mechanism. The self-correction mechanism occurs because the short-run aggregate supply curve shifts up or down to restore the economy to the long-run equilibrium at full employment (aggregate output at potential) over time. [1]

(2/8/2) Changes in Equilibrium:

Aggregate demand shocks:

Demand shocks cause the aggregate demand curve to shift. Figure (2/13), shows the effect of a rightward shift in the aggregate demand curve due to positive demand shocks caused by the following:

- An autonomous decreasing of monetary policy $(r \downarrow)$,a lowering of the real interest rate at any given inflation rate.
- An increase of government purchase $(G \uparrow)$.
- A decrease in taxes $(T \downarrow)$
- An increase in autonomous consumption expenditure $(C \uparrow)$
- An increase in autonomous investment $(I \uparrow)$.
- A decrease in Financial Frictions $(F \downarrow)$.

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1) Frederic S. Mishkin , previous reference, p 597.

Figure (2/13): Positive Demand Shock
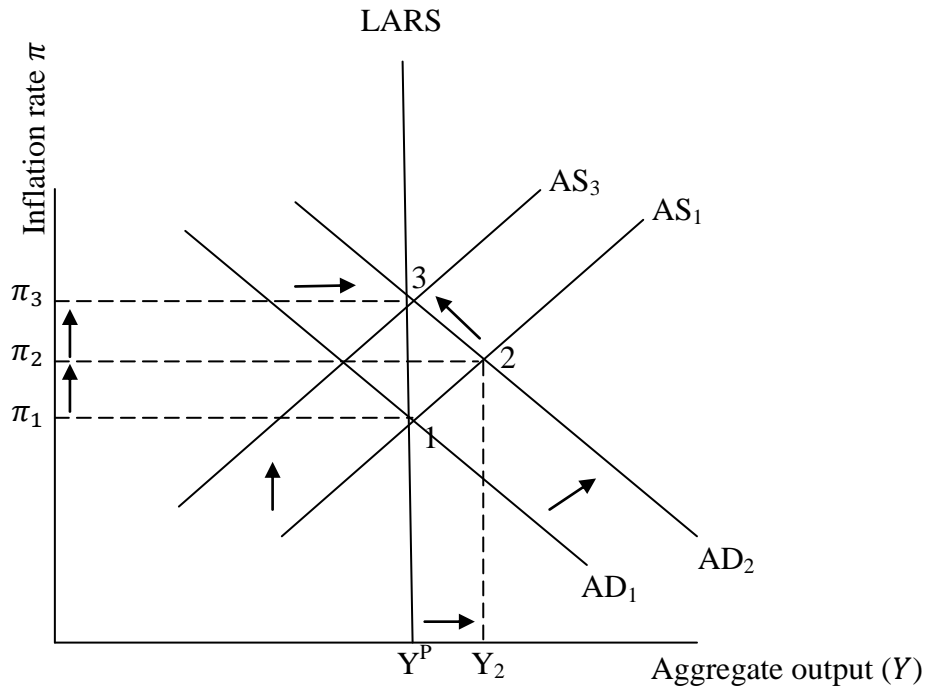
Source: Frederic S.Mishkin, Previous Reference.

Figure (2/14): Negative Demand Shock
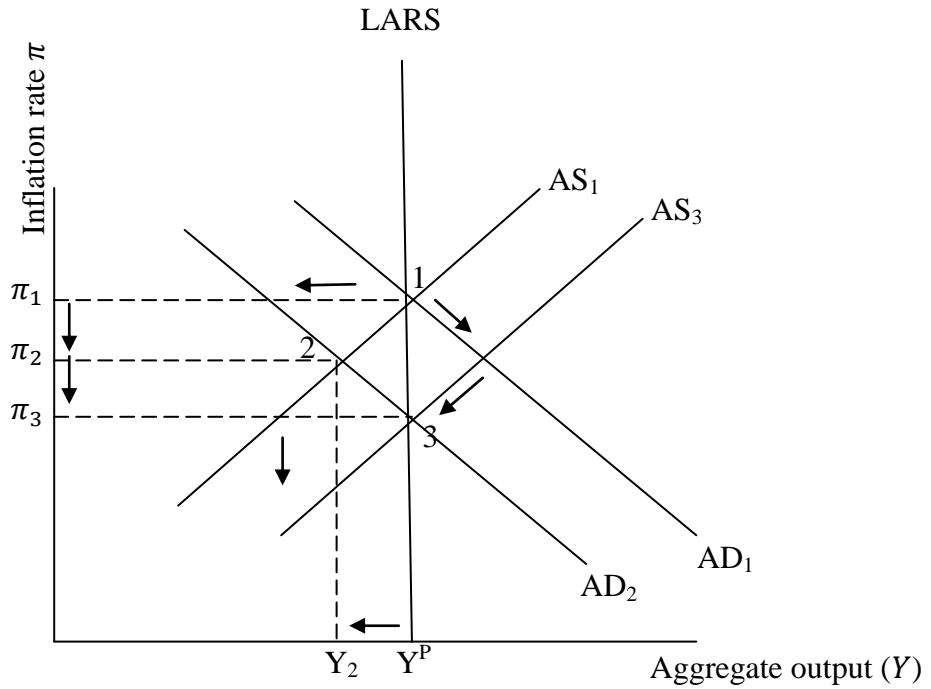
Source: Frederic S.Mishkin, Previous Reference.

In figure (2/13), the economy shows the initial equilibrium in long-run at point (1). Where the aggregate demand curve (AD), intersects the short-run aggregate supply curve (AS$_1$) at (Y^p) and the inflation rate at (π_1). Suppose that consumer and businesses become more optimistic and the resulting increase in autonomous consumption and investment create a positive demand shock that shifts the aggregate demand curve to the right to (AD$_2$). The economy moves up the short-run aggregate supply curve (AS$_1$) to point (2), and both output and inflation rise to (Y_2) and (π_2) respectively. However, the economy will not remain at point (2) in the long-run because output at (Y_2) is above potential output. Expected inflation will rise, and the short-run aggregate supply curve will eventually shift upward to AS$_3$. The economy (equilibrium) moves up the (AD$_2$) curve from point (2) to point (3), which is the point of long-run equilibrium where inflation equals (π_3) and output returns to (Y^p). Although the initial short-run effect of the rightward shift in the aggregate demand curve is a rise in both inflation and output, the ultimate long-run effect is only a rise in inflation because output returns to its initial level at (Y^p). Figure (2/14) shows negative demand shocks. Decrease in consumption expenditure and investment, shifting the aggregate demand curve to the left from (AD$_1$) to (AD$_2$). The economy moved to point (2), where output fell, unemployment rose, and inflation declined. The large negative output gap when output was less than potential caused the short-run aggregate supply to begin falling at (AS$_3$). The economy moved to point (3), where output return to potential, inflation declined further to (π_3), and unemployment falls back to its natural rate level. [1]

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1) Frederic S. Mishkin , previous reference, p 595.

Aggregate Supply (Price) Shock:

There are two types of supply shocks, which are ; temporary supply shocks in which the long-run aggregate supply curve doesn't shift. The permanent supply shocks in which the long-run aggregate curve will shift.

- **Temporary Supply Shocks:**

When a temporary shock involves a restriction in supply . It refers to a negative or (unfavorable) supply shock and it results in a rise in commodity prices. Example of temporary negative supply shocks are a disruption in oil supplies, a rise in import prices when a currency decline in value or a cost-push shock from workers pushing for higher wages that output productivity growth, driving up costs and inflation.

When the supply shock involves an increase in supply, it is called positive or favorable supply shock. Temporary supply shocks can come from particular increase in supply or fall in import prices. [1]

When the negative supply shocks hit the economy and prices rise, the price shock term (p) cause inflation to rise above (π_1), and the short-run aggregate supply curve shift up and to the left from (AS_1) to (AS_{2}). The economy will move up the aggregate demand curve from point (1) to point (2), where inflation rises above (π_1) but aggregate output falls below (Y^P), this what is called stagflation. Because the supply shock is temporary, productive capacity does not change, and so (Y^P) and the long-run aggregate supply curve (LRAS) remain stationary. At point (2), output is below its potential level at (Y_2) so inflation falls and shifts the short-run aggregate supply curve back down to initially at (AS_1) . The economy (equilibrium) slides down the aggregate demand curve (AD_1) (remain in the same position) and returns to the long- run equilibrium at point (1), where output is again at (Y^p) and inflation is at (π_1). Figure (2/15) shows this negative temporary supply shock:

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1) Frederic S. Mishkin , previous reference, p 595.

Figure (2/15): Temporary Negative Supply shock

LARS

Inflation rate π

AS$_2$

AS$_1$

π_2 ——————— 2

π_1 ——————— 1

AD$_1$

Y$_2$ Y^P Aggregate output (Y)
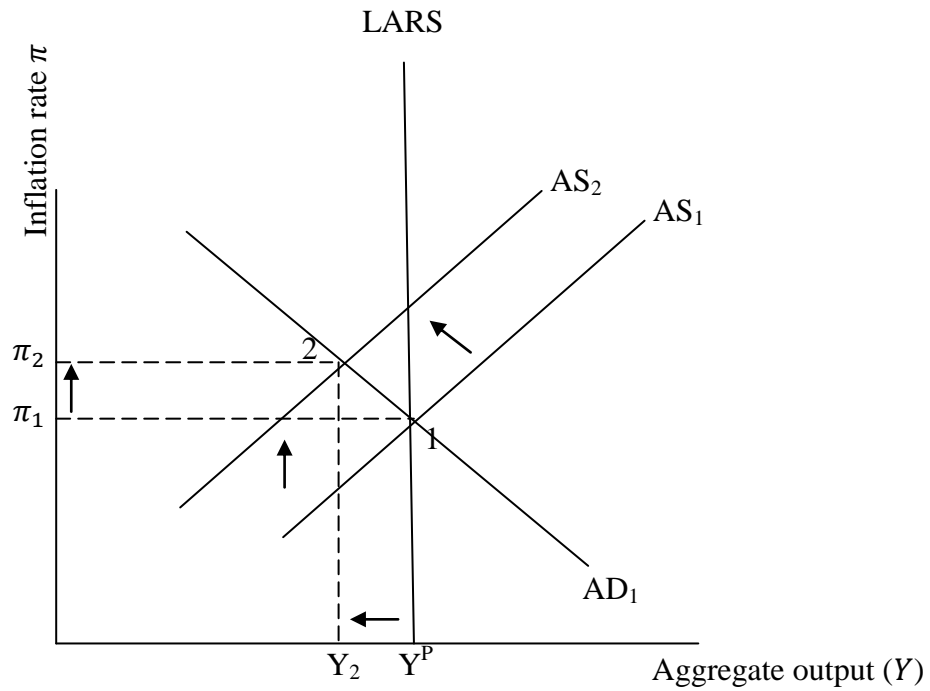
Source: Frederic S.Mishkin, Previous Reference.

Figure (2/16): Permanent Negative Supply Shock

LARS$_2$ LARS$_1$

Inflation rate π

AS$_3$

AS$_2$

π_3 ——————— 3

AS$_1$

π_2 ——————— 2

π_1 ——————— 1

AD

Y_2^p Y_2 Y_1^p Aggregate output (Y)
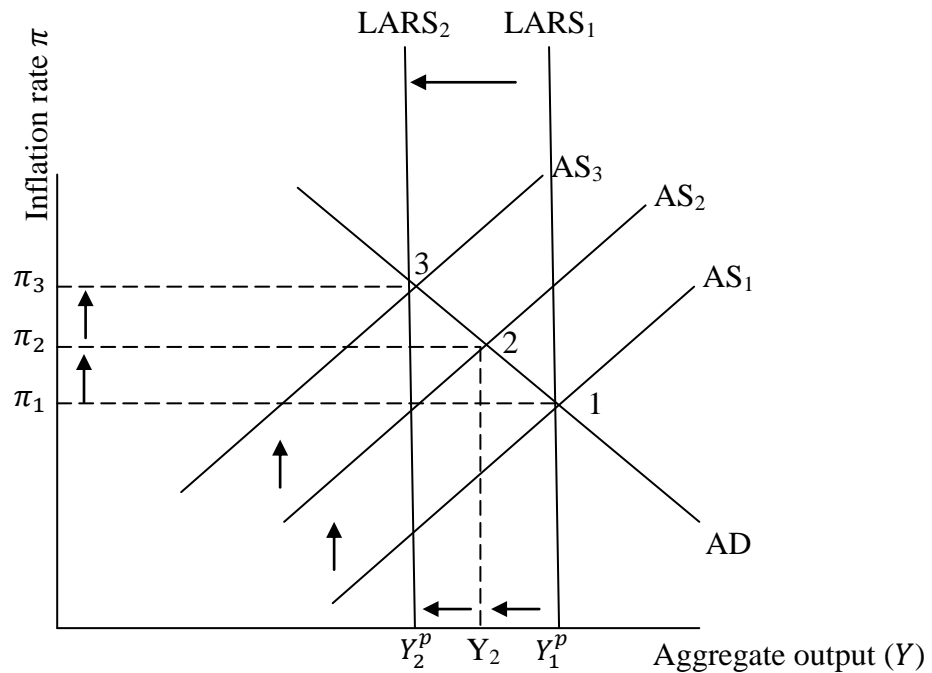
Source: Frederic S. Mishkin, Previous Reference.

Although a temporary negative supply shock leads to an upward and leftward shift in the short-run aggregate supply curve, which raises inflation and lowers output, the ultimate long-run effect is that output and inflation are unchanged.

A favorable (positive) supply shock, move all the curves in the opposite direction and so has the opposite effect. A temporary positive supply shock shifts the short-run aggregate supply curve downward and to the right leading initially to a fall in inflation and a rise in output. In long-run, however, output and inflation will be unchanged (aggregate demand curve remains constant). [1]

Permanent Supply Shocks:

A permanent supply shock, such as an increase in ill-advised regulation that cause the economy to be less efficient, thereby, reducing supply, would decrease potential output from (Y_1^P) to (Y_2^P) and shift the long-run aggregate supply curve to the left from $LRAS_1$ to $(LRAS_2)$, figure (2/16) . Because the permanent supply shock will result in higher prices. There will be a rise in inflation, and the short-run aggregate supply curve will shift up and to the left from (AS_1) to (AS_2). Although output at point (2), has fallen to (Y_2), it is still above (Y_2^P). The positive output gap means that the aggregate supply curve will reach (AS_3) at the intersection with the aggregate demand curve (AD) and the long-run aggregate supply curve $(LRAS_2)$. Because output is at (Y_2^P) at point (3), the output gap is zero and at an inflation rate of (π_3), no further upward pressure on inflation to occur. A permanent negative supply shock leads to both a decline in output both in the short- run and the long-run.

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1) Frederic S. Mishkin , previous reference, p 605.

(2/9) Monetary Policy Shortcomings:

Monetary policy has its limitations .The central bank control over money supply is imperfect for the following reasons:

(2/9/1) Money Multiplier Inaccuracy:

If the central bank manages the money supply , it must know the size of the money multiplier so that it can forecast the increase in the money supply resulting from change in excess reserve .The value of money multiplier , however, can be uncertain and subject to decisions independent of the central bank. The public's decision to hold cash and willingness of banks to make loans affect the total expansion from an initial change in excess reserves .These decisions vary with conditions of prosperity and recession .When the business cycle is in upturn , banks are very willing to use their excess reserves for making loans, and the money supply expands .During a downturn , bankers are less willing to use their excess reserves for making loans ,and money supply tends to contract.

Money supply definition determines what central bank control. There are different definitions of money supply ,which are (M1) and (M2). The central bank has to choose between them . Banks can pay higher interest rate and attract more customers to invest in certificates of deposit .Consequently ,the central bank might respond by focusing on (M2) instead of (M1). In fact , in recent years, the central bank has focused more on (M2) than (M1) because (M2) more closely correlates with changes in (GDP). [1]

(2/9/2) Lags in Monetary Policy:

Monetary policy is subject to time lags . First: an inside lag exists between the time a policy change is needed and the time the central bank identifies the problem and decides which policy tool to use . The inside lag is fairly short

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1) Irvin B. Tucher, previous reference, P. 684.

because financial data are available daily ,data on inflation and unemployment monthly, and data on real (GDP) within three months. Once the central bank has the data, it can quickly decide which policy changes are needed and make appropriate adjustments. The inside lag for monetary policy is shorter than for fiscal policy because fiscal policy is usually the result of a long political budget process.

Second: There is an outside lag between the time a policy decision is made and the time the policy change has its effect on the economy. This lag refers to the length of time it takes money multiplier or spending multiplier to have its full effect on aggregate demand ,and in turn, unemployment , the price level , and real (GDP). Although computer model estimates differ widely , the total lag (inside plus outside lags) for monetary policy can be 3 to12 months .

Aggregate demand and supply analysis yield the following conclusions:

1. A shift in the aggregate demand curve, caused by changes in autonomous government purchases taxes, autonomous net exports, autonomous consumption expenditure autonomous investment and financial frictions affect output in the short- run and has no effect in the long-run. The initial change in inflation is lower in short-run than the long-run change in inflation when the short-run aggregate supply curve has fully adjusted.

2. A temporary supply shock affects output and inflation only in the short-run and has no effect in the long-run.

3. A permanent supply shock affects output and inflation both in the short and the long-run.

4. The economy has a self-correction that returns into potential output and the natural rate of unemployment over time. [1]

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1) Irvin B. Tucher, previous reference, P. 685.

CHAPTER THREE

MACROECONOMIC VARIABLES

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MACROECONOMIC VARIABLES

Macroeconomics is the branch of economics that deal with a nation's economy as a whole. Macroeconomics focuses on the economic issues, unemployment, inflation, economic growth ,trade , and the gross domestic product (GDP).

Macroeconomics focuses on two basic issues: long run economic growth and economic fluctuation. We need to understand what happens during the long-run to understand the factor behind the rise in living standards in modern economies. Some countries have living standards much higher than other countries throughout the globe. Although living standards have improved overtime , the economy has not always grown smoothly . Economic performance has fluctuated overtime. Macroeconomics has two sides to speak about, the production and the income . The production approach measuring a nation's macroeconomic activity using gross domestic product(GDP).The income approach which measures a nation's macroeconomic activity using national income (NI).

(3/1) Gross Domestic Product (GDP):

(3/1/1) Definition and Concept:

The most widely reported measure throughout the world of a nation's economic performance is gross domestic product (GDP), which is the total market value of all final goods and services produced in a nation during a period of time, usually a year. (GDP) therefore excludes production abroad by national businesses, which is the differences between (GDP) and (GNP). (GNP) is the gross national product which is defined as the market value of all final goods and services produced by a nation's residents, no matter where they are located.

One advantage of (GDP) is that it avoids the measurement problem.(GDP) measurements value using dollars (or local currency of the country), rather than listing the number of products. That is, (GDP) relies on markets to establish the relative value of goods and services.(GDP) measure includes two sets of items, which are :(GDP) counts only new domestic production and it counts only final goods.

a- (GDP) Count New Domestic Production:

National income accountants calculating (GDP) carefully exclude transactions in two major areas:

- **Secondhand Transactions**: Current (GDP) does not include the sale of a used products such as used car or the sale of a house constructed some years ago. Such transactions are merely exchanges of previously produced goods and not current production of new goods that add to the existing stock of cars and houses. However, the sales commission on a used car or a house produced in another (GDP) period counts in current (GDP) because the salesperson performed a service during the present period of time.

- **Nonproductive Financial Transactions**: (GDP) does not count purely private or public financial transactions, such as giving private gifts, buying and selling stocks and bonds, and making transfer payments. A transfer payment is a government payment to individuals not in exchange for goods or services currently produced . Welfare, Social Security, veterans' benefits, and unemployment benefits are transfer payments. These transactions are considered nonproductive because they do not represent production of any new or current output. Similarly, stock market transactions represent only the exchange of certificates of ownership (stocks) or indebtedness (bonds) and not actual new production.

b- (GDP) Count Final Goods:

The popular press usually defines (GDP) as simply "the value of all goods and services produced." This is technically incorrect because (GDP) counts only final goods, which are finished goods and services produced for the ultimate user. In order to count only final goods and avoid overstating (GDP), national income accountants must take care not to include intermediate goods. Intermediate goods are goods and services used as inputs for the production of final goods. Intermediate goods are not produced for consumption by the ultimate user.

The reason that intermediate goods do not count as a final goods to avoid double counting . Although, measure of (GDP) using the current prices for goods and services ,(GDP) will increase if prices increase even if the physical amount of goods that are produced remains the same .Measuring the difference between change in output and changes in price level involves making an important distinction between nominal (GDP) and real (GDP).

Real (GDP) ,is the value of all final goods produced during a given time period based on the prices existing in a selected base year . Nominal (GDP) ,the value of all final goods based on the prices existing during the time period of production. The concept of real (GDP) ,a measure that controls for changes in prices . Nominal (GDP) can increase in three ways : first: output rises and prices remain unchanged . Second: prices rise and output is constant. Third: in the typical case , both output and prices rise .The differences between the real (GDP) and nominal (GDP) for any year arise only because of changes in prices. [1]

So by comparing real (GDP) and nominal (GDP) ,can measure the changes in prices for the economy . This can be done by creating an index , called the (GDP) deflator , that measures how prices of goods and services change overtime. To find the value of the (GDP) deflator for any year, the formula below is used:

1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – Economics – Principles, Application, and Tools – Seventh Edition – Pearson Education – 2012, P. 100.

$$(GDP)Deflator = \frac{\text{Nominal (GDP)}}{\text{Real (GDP)}} \times 100\% \underline{\hspace{2cm}} (1)$$

The most broadly based measure used to take the changes-in-price –level out of the nominal (GDP) and compute real (GDP) is called (GDP) chain price index. The chain price index is a method for calculating price changes that takes average of price changes using base year from consecutive years . The (GDP) price index is abroad deflator index calculated by a complex chain weighted geometric series. It is highly inclusive because it measures not only price changes of consumer goods , but also price changes of business investment , government consumption expenditures, exports, and imports The equation used in calculation is as follows:[1]

$$Real\ (GDP) = \frac{\text{Nominal (GDP)}}{\text{(GDP)Chain Price Index}} \times 100\% \underline{\hspace{2cm}} (2)$$

(3/1/2) Measuring (GDP) :

Circular Flow of Production and Income:

(GDP) is like an enormous puzzle with many pieces to fit together including markets for products, markets for resources, consumers spending , businesses spending, and earning money. All these concepts fit together is by using a simple macroeconomic model called the circular flow model. The circular flow model shows the flow of products from businesses to households and the flow of resources from households to businesses. In exchange of these resources, money payments flow between businesses and households. The circular flow shows a hypothetical economy with no government, no financial markets, and no foreign trade. In this ultra-simple pure market economy, only the households and the businesses make decisions.

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1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – previous reference – P. 101.

Figure (3/1): The circular Flow Model

Product Market

S

P

D

Q

Supply

Actual goods
and services

Demand $

$ Expenditures
(nominal GDP)

Businesses

Household

$ Factor payment
(wages, rents, profits,
interest)

Supply

Demand $

Factors of production
(land, labor, capital)

Factor Market

S

W

D

Q
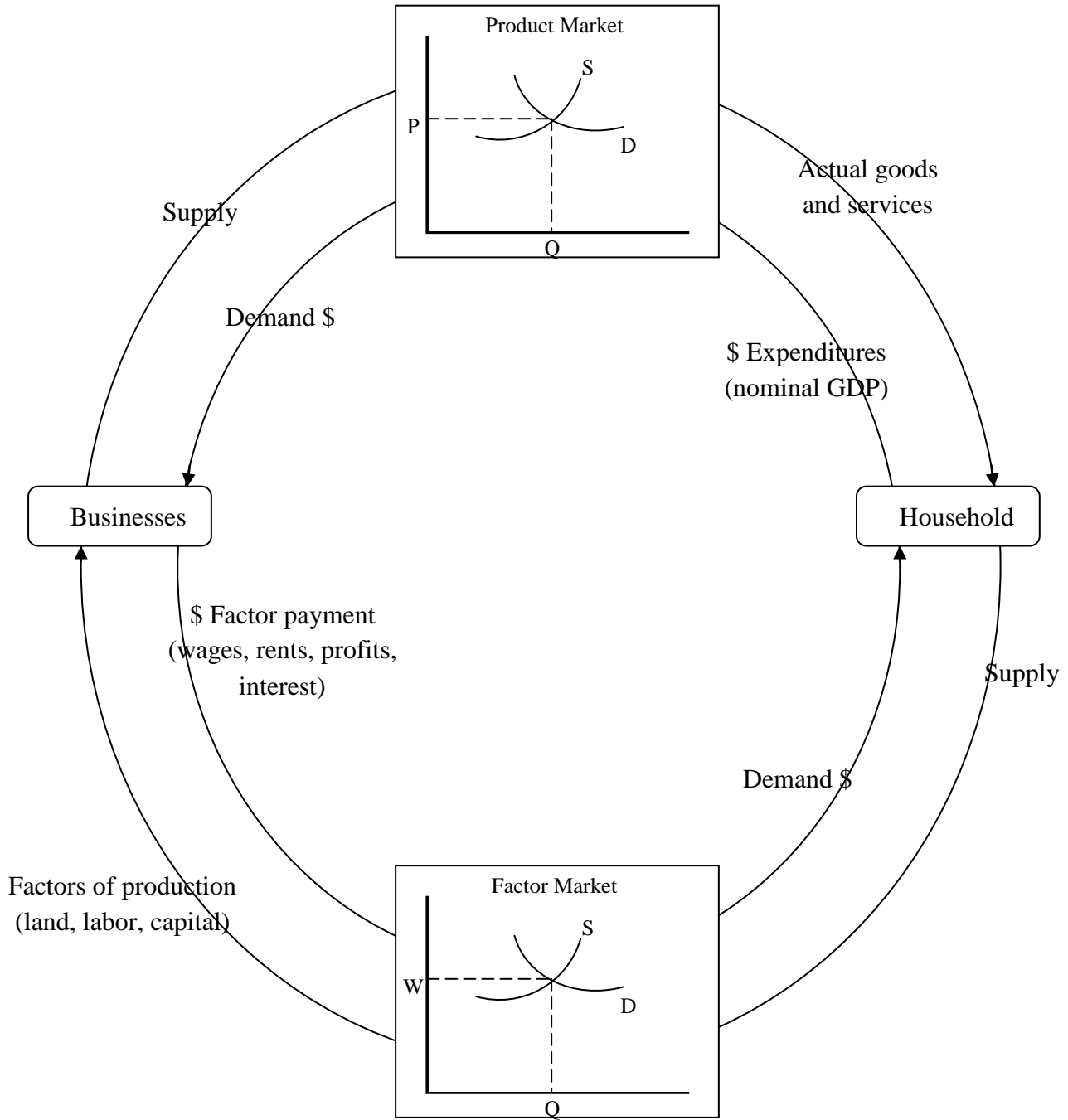
Source: Michael Melvin and William Boyes – Previous Reference.

Whereas:

$S \equiv$ Supply , $D \equiv$ Demand, $Q \equiv$ Quantity , $P \equiv$ Price , $W \equiv$ Wages

The circular flow model, figure (3/1), represents product markets, in which households exchange money for goods and services produced by firms. The supply arrow in the top loop represents all finished products and the value of services produced, sold, and delivered to consumers. The demand arrow in the top loop shows why the businesses make this effort to satisfy the consuming households. When consumers decide to buy products, they are actually voting with their dollars. This flow of consumption expenditures from households is sales revenues to businesses and expenses from the viewpoint of households. Notice that the box labeled product market contains a supply and demand graph. This means the forces of supply and demand in individual market determines the price and quantity of each product exchanged without government interference. The bottom half of the circular flow diagram consists of factor market, in which firms demand the natural resources, labor, capital, and entrepreneurship needed to produce goods and services sold in the product market. The hypothetical economy is capitalistic, and the model assumes for simplicity that households own the factors of production. Businesses therefore must purchase all their resources from households. The supply arrow in the bottom loop represents this flow of resources from households to firms, and the demand arrow is the flow of money payments for these resources. These payments are also income earned by households in the form of wages, rents, interest, and profits. As in the product market, market supply and demand determine the price and quantity of factor payments. [1]

All measurements in the circular flow model are rates of change (flows) and tells nothing about the total amounts (stocks) of goods and services, money, or anything else in the economy. Consumption expenditures, business production,

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1) Michael Melvin and William Boyes – previous reference – P. 330.

wages, rents, interest payments, and profits are flow of money for newly produced products or resources that affect the level of stocks not shown in the model.

The national income accountants calculate (GDP) in two approaches which are: expenditure approach and income approach .

(3/1/2-a) The Expenditure Approach:

One way national income accountants calculate (GDP) is to use the expenditure approach to measure total spending flowing through product markets in the circular flow diagram. The expenditure approach measures (GDP) by adding all the spending for final goods during a period of time. Expenditures break down into four components, which are:

- Consumption expenditures : purchases by consumers.

- Private investment expenditures : purchases by firms.

- Government purchases :purchases by federal, states and local government.

- Net exports :net purchases by the foreign sector.

- **Personal Consumption Expenditures (C):**

Consumption expenditures are purchases by consumers of currently produced goods and services, either domestic or foreign .Consumption expenditures break down into durable goods, nondurable goods, and services. Durable goods include items such as automobiles, appliances, and furniture because they last longer than three years. Food, clothing, soap, and gasoline are examples of nondurables, because they are considered to be used up or consumed in short time . Services, which are the largest category, include recreation, legal advice, medical treatment, education, and any transaction not in the form of a tangible object. [1]

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1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – previous reference – P. 102.

- **Gross Private Domestic Investment (I):**

The national account includes "gross" (all) "private" (not government) "domestic" (not foreign) spending by businesses for investment in assets that are expected to earn profits in the future. Gross private domestic investment is the sum of two components:

1. Fixed investment expenditures for newly produced capital goods, such as commercial and residential structures, machinery, equipment, and tools.

2. Change in business inventories, which is the net change in spending for unsold finished goods.

- **Government Consumption Expenditures and Gross Investment (G):**

Government purchases are the purchases of newly produced goods and services by federal , state, and local governments . They include any goods that the government purchases plus the wages and benefits of all government workers (paid when the government purchases workers' services as employees). For example, spending for police and state university professors enters the (GDP) accounts at the prices the government pays for them . Investment spending by government is also included. The government spends for investment additions to its stock of capital, such as tanks, schools, highways, bridges, and government buildings. Government purchases affect people's life very directly. [1]

This category does not include all spending by government. It excludes transfer payments , which are payments to individual that are not associated with production of goods and services . For example, payments for social security, welfare and interest on government purchases are considered transfer payments and thus are not included in government purchases in (GDP) .But, wage payments to the police, postal workers are included ,because they do correspond to services

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1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – previous reference – P. 102.

these workers are currently producing . Transfer payments are important, however, because they affect both the income of individuals, their consumption, and savings behavior . Also, transfer payments affect the size of government budget deficit.

- **Net Exports (X-M):**

Net exports expressed in the formula (X-M) ,which are the total exports minus total imports . Exports (X) are expenditures by foreigners for goods produced domestically and sold in other countries . Imports (M) are the dollar amount of purchases of goods produced abroad .Imports are subtracted from exports because (GDP) measures only domestic economic activities, foreign sales must be removed.

Using the expenditure approach, (GDP) is expressed mathematically as:

$$GDP = C + I + G + (X - M) _____ (3)$$

Whereas:

GDP :Gross Domestic Product.

C :Personal consumption expenditure .

I: Gross private domestic investment.

G: Government consumption expenditure and gross investment.

(X- M) : Net exports.

In other words,

GDP= consumption +investment + government purchases + net exports. [1]

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1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – previous reference – P. 102.

This equation is identity ,which means it is always true no matter what the values of variables are. This simple equation plays a central role in macroeconomics. It is the basis for analyzing macro problems and formulating macro policies.

(3/1/2-b) The Income Approach:

The second, more complex approach in measuring (GDP) is the income approach. The income approach measures (GDP) by adding all the incomes earned by households in exchange for the factors of production during a period of time. Both expenditure approach and the income approach yield identical (GDP) calculation. As shown in the basic circular flow model (page 101), each dollar of expenditure paid by households to business in the product markets means a dollar of income flows to households through the factor markets as a payment for the use of land , labor, and capital required to produce the product.

Using the income approach, (GDP) is expressed as follows:

$$GDP = Compensation\ of\ employees + rents + profits + net\ interest + indirect\ taxes + depreciation _____ (4)$$

The national income is divided into six basic categories which are: [1]

1. Compensation of Employees: (wages and benefits):

Employees' compensation is the largest component of the national income accounts, it is income earned from wages, salaries, and certain supplements paid by firms and government to suppliers of labor. Since labor services play an important role in production, it is not surprising that employee compensation represents the largest share of the income pie. The supplements consist of employer taxes for Social Security and unemployment insurance. Also, included fringe benefits from a

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1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – previous reference – P. 105.

variety of private health insurance and pension plans. For most of the countries in the world , wages and benefits are the largest part of national income .

2. Rental Income to Landlords:

The smallest source of income is from rent and loyalties received by property owners who permit others to use their assets during a time period. This category includes house and apartment rents received by landlords.

3. Profits:

Profits are of two categories :

- **Proprietors' Income:**

All forms of income earned by unincorporated businesses. Self-employed proprietorships and partnerships simultaneously own their businesses and pay themselves for labor services to their firms.

- **Corporate Profits:**

Corporate Profits are income category that includes all income earned by the stockholders of corporations regardless of whether stockholders receive it.

Corporate profit is the sum of three sources:

- Individuals.
- Undistributed corporate   profits(retained earnings for expanding plant and equipments). [1]
- Corporate income taxes . (thus corporate profits using the income approach before taxes).

4. Net Interest:

Households both receive and pay interest. Persons who make loans to businesses earn interest income. Households also received interest from savings accounts and certificates of deposit. On the other hand, households borrow money

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1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – previous reference – P. 106.

and pay interest , for example, credit cards, installment loans, and mortgage loans. The net interest is the difference between interest income earned and interest payments.

5. Indirect Business Taxes:

Indirect business taxes are levied as a percentage of the prices of goods sold and therefore, become part of the revenue received by firms. These taxes include sales taxes, federal excise taxes, license fees, business property taxes, and custom duties. Indirect taxes are not income payments to suppliers of resources. Instead, firms collect indirect taxes and send these funds to the government. These taxes are included in the price, but are income for the government, which represents the public interest of households.

6. Depreciation:

Depreciation is the consumption of fixed capital . This somewhat imposing term is simply an allowance for the portion of capital worn out producing (GDP). Over time, capital goods, such as buildings, machines, and equipment wear out and become less valuable. Depreciation (capital consumption allowance) is therefore a portion of (GDP) that is not available for income payments. Because it is impossible to measure depreciation accurately, an estimate is entered. [1]

(3/1/3) (GDP) Shortcomings:

(GDP) is the best measure of the value of output produced by an economy. (GDP) and related indicators used to measure economic growth within a country . Also, to determine if an economy has fallen into recession or has entered into a depression . For various reasons, (GDP) omits certain measures of overall economic well-being. Because (GDP) is the basis of government economic policies, there is concern that (GDP) may be giving a false impression of the nation's material well-being. But while (GDP) is a very valuable measure of

wellbeing of an economy , it is not a perfect measure , because it does not take into account house workers and childcare, leisure, the underground economy ,or pollution.

- **Non- market Transactions:**

As (GDP) counts only market transactions, it excludes certain unpaid activities, such as home maker production, child rearing, and do-it-yourself home repairs and services. There are two reasons for excluding nonmarket activities from (GDP):

First: it would be extremely imprecise to attempt to collect data and assign money value to services people provide for themselves or others without compensation. Second: it is difficult to decide which nonmarket activities to exclude and which ones to include.

The issue of unpaid , do- it –yourself activities affects comparisons of (GDPs) of different nations . One reason , some less-developed nations have lower (GDPs) than major industrialized nations, that is a greater portion of people in less-developed nations farm , clean, make repairs, and perform other tasks for their families rather than hiring someone else to do the work.

- **Distribution, Kind, and Quality of Products:**

(GDP) is blind to whether a small fraction of the population consumes most of a country's (GDP) or consumption is evenly divided. (GDP) also blind with respect to the quality and kinds of goods and services that make up a nation's (GDP). [1]

- **Neglect of Leisure Time:**

In general, the wealthier a nation becomes ,the more leisure time its citizens can afford. Rather than working longer time hours , workers often choose to increase their time for recreation and travel. In the United States , the length of work week declined steadily from about 50 hours in 1990 to about 34 hours in 2005[2]. It can

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1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – previous reference – P. 106.
2) Economic Report of the Present, 2006, http://www.gpoaccess.gov/eop, table B-47

be argued that (GDP) understates national wellbeing because no allowance is made for people working fewer hours than they once did.

- **The Underground Economy:**

Illegal gambling, prostitution, loan-sharking, illegal guns, and illegal drugs are goods and services that meet all the requirements for (GDP). They are final products with a value determined in markets, but (GDP) does not include unreported criminal activities. The "underground" economy also includes tax evasion.

One way to avoid paying taxes on legal activity is to trade or barter goods and services rather than selling them . Another way is that individuals and businessmen make legal sales for cash and do not report the income earned to the Internal Revenue Services .

Estimate of the size of this subterranean economy vary . Some studies by economists estimate the size of underground sector to be between 9-13 percent of (GDP)[1]. The conclusion of all these is that, (GDP) is a quantitative, rather than a qualitative measure of the output of goods and services. If the underground economy is sizable, (GDP) will understate an economy's performance.

- **Economic Bads (defects):**

More production means a larger (GDP) ,regardless of the level of pollution created in the process . Air ,water and noise pollution are economic bads that impose costs on society not reflected in private market prices and quantities bought and sold. When a polluting company sells its products, this transaction increase (GDP) . In another way , if production result in pollution and environmental damage, (GDP) overstates the nation's well-being .[2]

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1) James Sproul, "The other path: Why Are Your Neighbors Paying in Cash?" The Wall Street Europe, Feb, 28, 2001, p 8.
2) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – previous reference – P. 107.

(3/1/4) Fluctuations in (GDP):

Real (GDP) does not always grow smoothly . Sometimes it collapses suddenly and the result is an economic down turn . This fluctuation called business cycles. The business cycle consists of alternating periods of economic growth and contraction . A key measure of cycles is the rise and fall in real (GDP) , which show changes in employment and other key measures of the macro economy.

Although business cycle vary in duration and intensity , each cycle is divided into four phases : peak , recession , trough ,and recovery. The business cycle looks like a roller coaster . It begins at a peak , drops to bottom , climbs steeply and then reaches another peak. At each of these peaks , the economy is close to or at full employment . That is, the economy is operating near its production curve and real (GDP) is at highest level relative to recent years .

A recession is down turn in the business during which real (GDP) declines, business profits fall, the percentage of the workforce without jobs rises , and production capacity is underutilized . a general rule is that a recession consists of at least two consecutive quarters (six months).

A trough is where the level of the real (GDP) "bottoms out". At the trough , unemployment and idle productive capacity are at their highest level relative to recent years . The length of time between the peak and the trough is the duration of the recession .The trough is both bad news and good news . It is simultaneously the bottom of the valley of the downturn and the foot of the hill of improving economic conditions called a recovery or expansion. A recovery is an upturn in the business cycle during which real (GDP) rises . During the recovery phase, profits generally improve, real (GDP) increases, and employment moves toward full employment . [1]

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1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – previous reference – P. 111.

(3/1/5) Other National Accounts:

In addition to (GDP), the media often report several other national accounts because they are necessary for studying the macro economy. Which are:

(2/1/4-a) National Income (NI):

Income is the other side of macroeconomics . In addition to measuring a nation's activity by measuring production , also can gauge it by measuring a nation's income . The total income earned by residents working in the country and aboard is called national income . National income (NI) is the total income earned by a nation's residents both domestically and abroad in the production of goods and services .

To measure national income , economist make two adjustments to (GDP) . First: they add to (GDP) the net income earned by the country firms or residents abroad. To make this calculation , add to (GDP) any income earned abroad by firms or residents and subtract any income earned in the country by foreign firms or residents . The result of these adjustments is the total income earned worldwide by a country firms or residents which is the gross national income (GNI). The second adjustment is that ,when calculating national income is to subtract depreciation from (GNP), it gives net national income (NNI) , where net means after depreciation. [1]

Also it can be calculated by subtracting the depreciation from (GDP). (GDP) is not entirely a measure of newly produced output because it includes an estimated value of capital goods required to replace those worn out in the production process. The measurement designed to correct this deficiency is national income (NI). National income (NI) is the total income earned by resource owners, including wages, rents , interest , profits, and indirect business taxes . (NI) is the gross

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1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – previous reference – P. 112.

domestic product minus depreciation of the capital worn out in producing output. Stated as a formula:

$$NI = GDP - Depreciation\ (Consumption\ of\ Fixed\ Capital)\ \rule{2cm}{0.4pt}\ (5)$$

Whereas:

NI: National income.

GDP: Gross domestic product.

(NI) measures how much income is earned by households who own and supply resources. It includes the total flow of payments to the owners of the factors of production, including wages, rents, interest, and profits. Another way to compute national income is to add compensation of employees, rents, profits, net interest, and indirect business taxes.

National income is not the appropriate measure for two reasons:

- First, (NI) excludes transfer payments, which constitute income that can be spent, saved, or used to pay taxes.
- Second, (NI) includes corporate profits, but stockholders do not receive all these profits. A portion of corporate profits is paid in corporate taxes. Also, retained earnings are not distributed to stockholders but are channeled back into business operations. [1]

(2/1/5-b) Personal Income (PI):

National income measures the total amount of money earned, but determining the amount of income actually received by households (not

1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – previous reference – P. 112.

businesses) requires a measurement of personal income (PI). Personal income is the total income received by households that is available for consumption, saving, and payment of personal taxes.

To calculate personal income , subtract any corporate profit from the national income . Corporate profits that are retained by the corporation and not paid out as dividends to households . Also, subtract all taxes on production , imports, and social insurance taxes , which are payments for Social Security and Medicare. Therefore, add any personal interest income received from the government and consumers and all transfer payments .

(2/1/5-c) Disposable personal income (DI):

Disposable personal income is the amount of income that households actually have to spend or save after payment of personal taxes. Disposable, or after-tax income, is equal to personal income minus personal taxes paid to federal, state, and local governments. Personal taxes consist of personal income taxes, personal property taxes, and inheritance taxes. [1]

DI= PI – Personal taxes _____ (6)

Whereas :

DI: Disposable personal income.

PI: Personal income.

(3/2) Balance of Payments:

(3/2/1) Definition and Concept:

Balance of payments concerned with net transactions between one country and the rest of the world. The balance of payments is a record of country's trade in goods, services, and financial assets with the rest of the world.

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1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – previous reference – P. 113.

The balance of payments is an accounting statement known as a balance sheet. A balance sheet is based on double-entry book keeping, a system in which every transaction is recorded in at least two accounts. Transactions that lead to a receipt of payment from foreigners, such as a commodity export or the sale of assets abroad, are recorded in the balance of payment accounts as a credit. Transactions that lead to payment to foreigners, such as a commodity import or the purchase of foreign assets, are recorded as a debit. In calculating the balance of payments, credits are positive and debits are negative, so the overall balance is simply credits minus debits. [1]

(3/2/2) Balance of Payments Accounts:

Balance of payments is divided into two broad parts. One part deal with payments for goods and services, income and transfers. This is known as the current account. The other part records transactions in assets and is known as the capital and financial accounts.

(3/2/2-a) Current Account:

The current account is the sum of the balances in the merchandise, services, income and unilateral transfers accounts.

- **Merchandise:**

Often called visible account, trade account, or the merchandise account. It records payments and receipts arising from import and export of tangible goods such as computers, cars, wheat and shoes. The exports of goods by a country are merchandise credits, brining money into a country. Its imports of foreign goods are merchandise debits, taking money out of the country. Merchandise account shows a deficit when imports exceed exports and the opposite is true .

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1) Michael Melvin and William Boyes – previous reference – P. 124

- **Services:**

Trade in services covers transactions that do not involve a physical commodity or asset exchanged by hands. It includes travel, tourism, royalties, transportation costs, and insurance premium.

- **Income:**

Income includes employee compensation and investment income. Compensation earned by a country workers abroad is a credit. Compensation earned by foreign workers in a country is a debit.

Investment income is the return on a special kind of service. It's the value of services provided by capital in foreign countries. The income earned from investment in foreign countries is a credit, the income paid to foreign – owned investment in the country is a debit. [1]

- **Unilateral – Transfers:**

In an unilateral transfers, one party gives something but gets nothing in return. Gifts and retirement pensions are forms of unilateral transfers.

All components of current account other than trade in goods and services referred to as invisible.

The current account is a useful measure of international transaction because it contains all of the activities involving goods and services.

(3/2/2-b) Financial and Capital Account:

The other major component of balance of payments is the capital and financial accounts, which record transactions related to international movements of

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1) Lipsy and Chrystal – Economics – USA – First Edition – Oxford University Press – 2007 – P. 498

ownership of financial assets .This involves financial instruments such as ownership of company shares, bank loans, or government securities.

In balance of payments the capital account and financial account are intermized separately. The capital account is made up of capital transfers and acquisition disposal of non-produced, non-financial assets. The capital transfer includes items such as government investment granted to build a hospital overseas, and debt forgiveness between a country government and an overseas government. The acquisition of non-produced, non-financial assets includes overseas sales or purchase of patents, trademarks or copyrights. [1]

The financial account which is made up of four elements: direct investment, portfolio investment relates to changes in non-resident ownership of domestic firms, resident ownership of domestic firms, and resident ownership of foreign firms.

Portfolio investment is investment in bond or a minority holding of shares that does not involve legal control. Direct and portfolio investment combined are sometimes referred to as the long-term capital element of the capital and financial accounts.

Other investment is made up mainly of what is called short-term capital flows. These include transfer into overseas banks, and sales or purchases of short-term financial instruments, such as treasury bills or commercial bills.

Reserve assets reflect changes in the official foreign exchange reserves that are held by the Central Bank. [2]

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1) Michael Melvin and William Boyes – previous reference – P. 124
2) Michael Melvin and William Boyes – previous reference – P. 125

(3/2/3) The Statistical Discrepancy Account:

This means that it is a balancing item, called net errors and omissions ,included in the balance of payments. The government cannot accurately measure all transactions that took place. Some international shipments of goods and services go uncounted or miscounted. The balancing items stand for all unrecorded transactions and is defined to be equal to the difference between the measured current account and the measured capital and financial accounts, and net errors and omissions that is always zero by construction.

(3/2/4) Deficit and Surplus Balance of Payments:

The current account reflects the movement of goods and services into and out of a country . The financial account reflects the flow of financial assets into and out of a country. The balance of payments must balance. If there is a deficit in the current account, there must be surplus in the financial account that exactly offsets that deficit.

The deficit and surpluses tell whether a country is a net borrower from or lender to the rest of the world. A deficit in the current account means that a country is running a net surplus in its financial account. And it signals that a country is a net borrower from the rest of the world. A country that is running a current account deficit must borrow from abroad an amount sufficient to finance that deficit.

A financial account surplus is achieved by selling more bonds and other debts of domestic country to the rest of the world than the country buys from the rest of the world.

(GDP) is the value of a nation's output, it is equal to the sum of consumption, investment, government spending and net exports, or:

$$GDP \ = \ C \ + \ I \ + \ G \ + \ X \ _____ \ (7)$$

This equation could be rewrite in terms of X as:

$$X \ = \ GDP - C - I - G \ _____ \ (8)$$

(X) is total spending in net exports involving trade in goods and services. This is the large component of the current account. Thus, a country that is running a current account deficit will have a negative (X). the negative net exports or a current account deficit is consistent with domestic spending being in excess of domestic production. Such a country must borrow to cover this difference between production and spending.

A country with a current account surplus in its balance of payments must, at the same time, have acquired net claims on foreigners to the same value. [1]

(3/2/5) Debates about Deficit:

The government expenditure include goods and services purchased by the government and transfer payments, such as social security and welfare, made to citizens, a surplus occurs when government's revenue exceeds its expenditure in a given year. The government runs a deficit when it spends more than it receives revenues from either taxes or fees in a given year.

There are five debates about deficit, which are:

- **Deficit Load to Inflation ;** If a government spending is more than revenues, it needed to fill the gap, it has two options to fill this gap. First: is to borrow from the public in return for government bonds. In the future the government would have to pay back the value of bonds and the interest on them. Second: To cover the gap is simply to create new money. In principle, governments could use a mix of borrowing money and creating money to cover its deficit.

If a country has no options other than creating money to finance deficit, in other words, if the public unwilling to buy government bonds, these deficit will inevitably cause inflation. Hyperinflation occurs when economies run large deficits and monetize then.

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1) Michael Melvin and William Boyes – previous reference – P. 127

- **Government debt can be a burden on future generations;** The national debt, or total government debt, can impose two different burdens on society, both of which fall on future generations. First: a large debt can reduce the amount of capital in the economy and thereby, reduce future income and real wages for the citizens. The savings of individuals and institutions flow into capital formation and increases an economy's capital stock. For example, when savers purchase new stocks and bonds, the companies issuing them use the proceeds to invest in plants and equipments.

   Second ;when the government experiences deficit and increases its national debt, it also finances its spending by selling bonds to same savers, who might hold both types of assets in their portfolios. The result of government deficit is that less savings are valuable to firms for investment. [1]

- **Deficit affects the size of government;** Financing government expenditure through deficits, rather than through higher taxes, will inevitably lead to higher government spending and largely inflated government.

- **Deficit can be good for an economy;** During a downturn running a deficit helps to stimulate private sector spending. Consequently, the government may deliberately practice deficit to pull the economy out of a recession. The deficit that government creates put additional income into the hands of the public. With more money, people do not have to reduce their consumption spending. Deficit automatically emerge during recessions, which also stabilize the economy. As income falls during a recession, so do tax payments. Transfer payments such as welfare and food stamps rise. Because government spending increases while tax revenues fall, the deficit must rise. However arising deficit may be what it takes to steer the economy back to full employment.

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1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – previous reference – P. 115.

Deficit can also play a role in tax smoothing. Suppose there is a large, temporary increase in government spending. As might occur during war. The government could either finance the war by running a deficit and issuing debt or by increasing tax rates to keep the budget in balance. [1]

- **A balanced-budget amendment really works;** Many different budgetary constitutional amendments have been proposed, they all require a time lag , the government propose in each fiscal year a budget in which total revenues cover total expenditures. The amendments have various escape clauses, for example, to allow borrowing during recession when deficits naturally emerge. Finally, some versions would limit the rate of spending increase to the rate at which (GDP) is growing.

(3/3) Unemployment:

(3/3/1) Definition and Concept:

During periods of slow economic growth , few jobs are created , and large numbers of workers become unemployed . Both public and policymakers become concerned about the lack of jobs and the increase in unemployment. Unemployment is normally defined as adults actively looking for work, but without job. Unemployment creates a cost to the entire economy in terms of loss of output. Unemployment rate is the percentage of people in the civilian labor force who are without jobs and are actively seeking jobs. All people without jobs are not classified as unemployed. Babies, full-time students, and retired persons are not counted as unemployed. Individuals who are ill or severely disable are not included as unemployed.

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1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – previous reference – P. 115.

The civilian labor force is the number of people 16 years of age and over who are either employed or unemployed, excluding members of the armed forces and other groups not in labor force. [1]

Unemployment categories are divided into:

- A job loser, whose employment was involuntarily terminated or who was laid off (varies between 40 and 60 percent of unemployed).
- A reentrant, having worked a full-time job before having been out of the labor force (varies from 20 – 30 percent of the employed).
- job leavers, who voluntarily ended employment (varies from 20 – 30 percent of the employed).
- A new entrant, who has never worked a full-time job for two weeks or longer (varies from 10 – 20 percent of the employed).

The civilian unemployment rate is computed using the following formula:

$$Unemployment\ Rate = \frac{Unemployed}{Civilian\ Labor\ Force} \times 100\% _____ (9)$$

Unemployment rate is criticized for both understating and overstating the unemployment rate. Over-stating unemployment rate occurs when respondent to the Bureau of Labor Static (BLS) survey falsely report they are seeking unemployment. The motivation may be that their eligibility for unemployment compensation or welfare benefits depends on actively pursuing a job. Or possibly an individual is employed in illegal activities. On other hand, the official definition of unemployment understates the unemployment rate by not counting the discourage workers. Discourage worker is a person who wants to work, but who has given up searching for work because he or she believes there will be no job

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1) Roger Le Roy Miller – previous reference – P. 142.

offers. Another example of understating the unemployment rate occurs because the official Bureau of Labor Static (BLS) data include all part-time workers as fully employed. Unemployment statistics do not measure unemployment if jobs are scarce and a college graduate takes a job not requiring his or her level of skill, a human resource is underutilized. Or, an employer reduces an employee's hours of work from 40 to 20 hours per week. [1]

Figure (3/2): Population, Employment and Unemployment

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                    ┌─────────────────────┐
                    │  Total Population    │
                    │   age 16 and over    │
                    └─────────────────────┘
```

Not in labor force
- Armed forces
- Household workers
- Students
- Retires
- Person with disabilities
- Institutionalize persons
- Discouraged workers

Civilian labor force

Employed
- Employee
- Self-employed workers

Unemployed
- New entrants
- Re-entrants
- Lost last job
- Quit last job
- Laid off
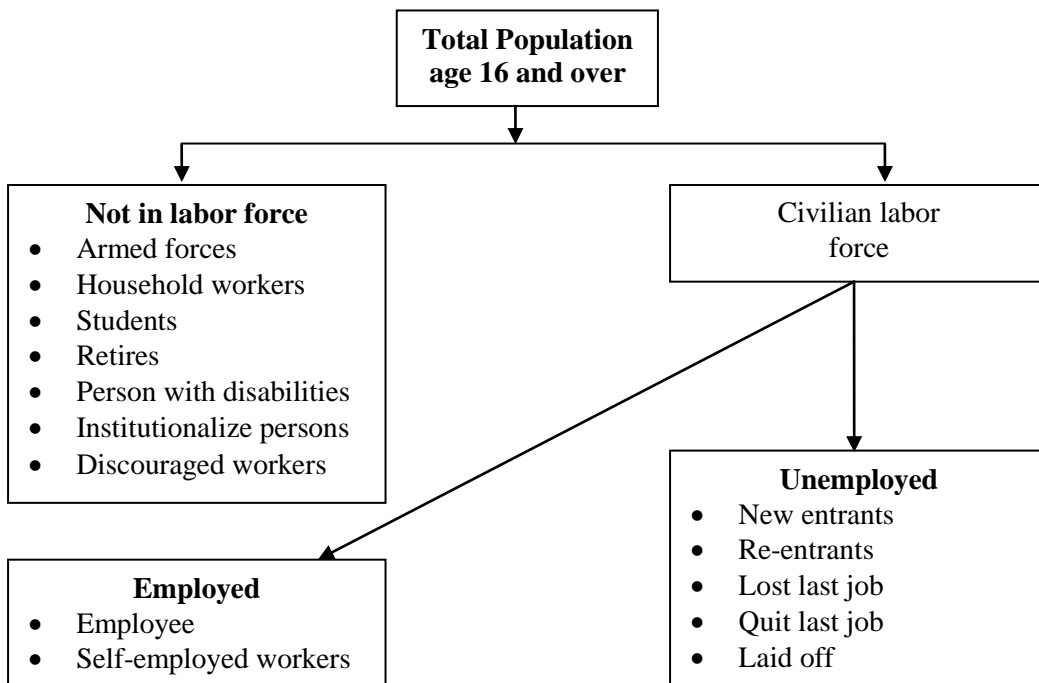
Source: Economic Report of the President, 2010,http://www.gpoaccess.gov/eop/,Table B -35.

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1) Roger Le Roy Miller – previous reference – P. 145.

Figure (3/3): Unemployment Rates for Selected Nations, 2009
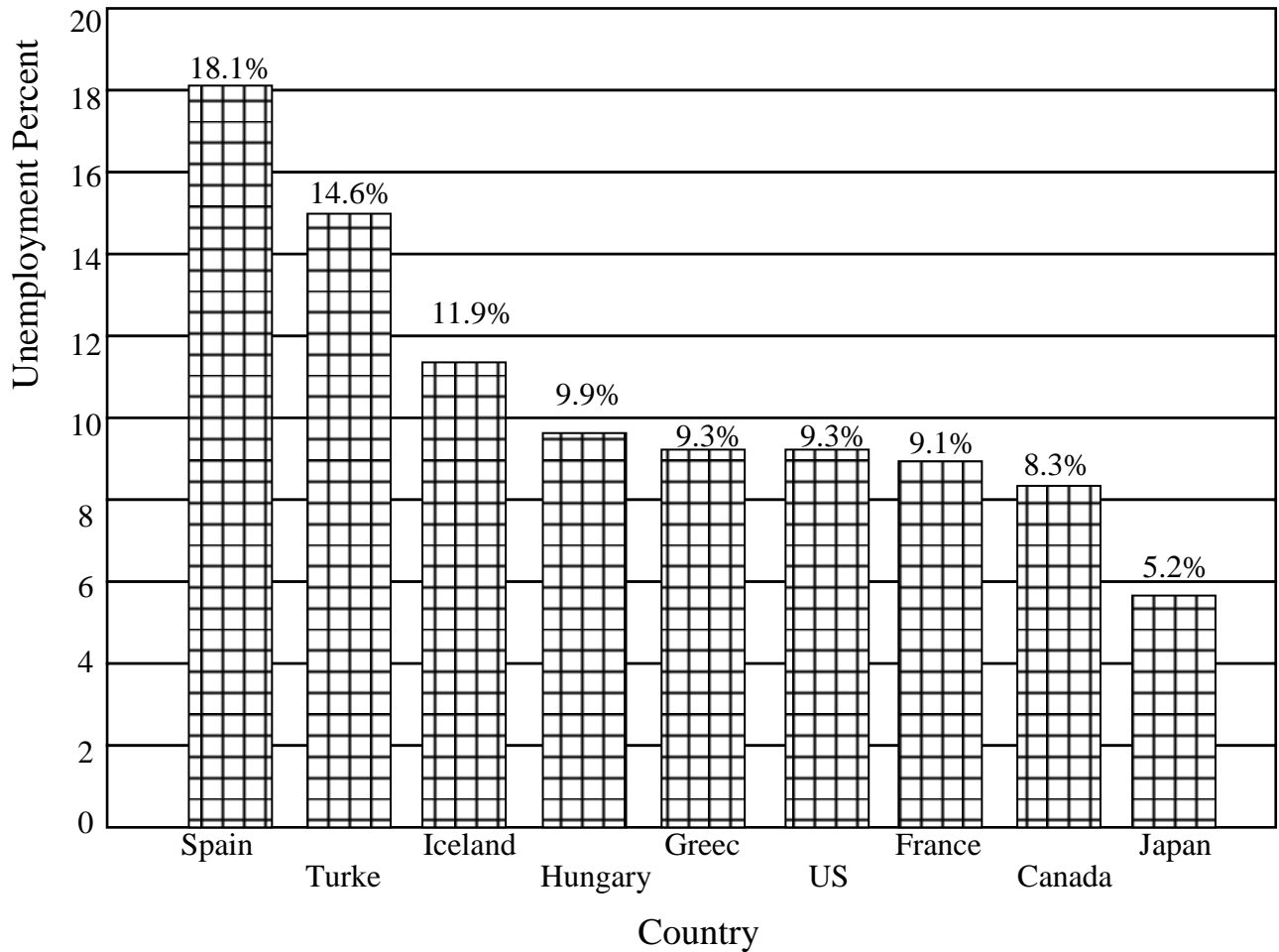
Source: Economic outlook, no. 86, http://www.oecd.org, annex table 18.

In 2009, the major industrialized nations shown in figure(3/3) had a higher unemployment rate than the United State which has an unemployment rate of 9.3%, while France, Canada and Japan had lower rates.

(3/3/2) Types of Unemployment:

Unemployment rate is determined by three different types of unemployment; frictional, structural and cyclical. Understanding these categories of unemployment assist in understanding and formulating policies to ease the burden of unemployment. Each type requires a different policy prescription to reduce it.

1. Frictional Unemployment:

Frictional unemployment is the unemployment that occurs naturally during the normal working of the economy . It occurs because it simply takes times for people to find the right jobs and for employers to find the right people to hire.

Frictional unemployment is unemployment caused by the normal time required by workers with marketable skills who are changing jobs, initially entering the labor force, or reentering the labor force, or seasonally unemployed. The cause of frictional unemployment is either the transition time to a new job or the lack of information required to match job applicant immediately with job vacancies. For this reason, frictional unemployment is sometimes called transitional unemp-loyment or search unemployment. [1]

The fact that job market information is imperfect and operate with friction, causes frictional unemployment in the economy. Because it takes time to search for the information to match employers and employees, some workers will always be frictionally unemployed is a normal condition in economic system permitting freedom of job choice. Improved methods of distributing job information through job listings on the internet help unemployed workers to find jobs more quickly and reduce frictional unemployment.

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1) Michael Melvin and William Boyes , previous reference, p 139

2. Structural Unemployment:

Unlike frictional unemployment, structural unemployment is not a short-term situation. Instead, it is a long-term one, or possibly permanent unemployment resulting from the nonexistence of jobs for unemployed workers. Structural unemployment is unemployment caused by a mismatch of the skills of workers who are out of work and the skills required for existing job opportunities. Putting in mind that changing jobs and lack of job information are not problems for structurally unemployed workers. Unlike frictionally unemployed workers who have marketable skills, structurally unemployed workers require additional education or retraining. The following are four causes of structural unemployment:

First: Workers may face joblessness because they lack the education or the job-related skills to perform available jobs. This type of structural unemployment affects teenagers and minority groups, but other groups of workers can be affected as well. Reducing such structural unemployment requires retraining loggers for new jobs. [1]

Second: The consuming public may decide to change demand for products. This shift in demand would cause workers who lost their jobs to become structurally unemployed. To regain employment, these unemployed workers must retrain and find job openings in other industries.

Third: Implementation of the latest technology may also increase the pool of structural unemployment in a particular industry and region. When modern machinery replace worker. This unemployed workers do not wish to move to a new location where new types of jobs are available. The cost of moving, fear of the unknown and family ties are reasons for unwilling to move, and these workers become structurally unemployed.

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1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – previous reference – P. 126.

Fourth: There are many causes of structural unemployment including poor schools, new products, new technology ,foreign competition, geographic differences, restricted entry into jobs and shifts in government priorities. Because of the numerous sources of mismatching between skills and job, economics consider a certain level of structural unemployment is inevitable. Public and private programs that train employees to fill the existing job openings decrease structural unemployment.

3. Cyclical Unemployment:

During periods of falling (GDP) , firms will not want to employ as many workers as they do in good times , because they are not producing as many goods and services. Firms will lay off or fire some current workers and will be more reluctant to add new workers to their payrolls . The result will be fewer workers with jobs and rising unemployment . This is cyclical unemployment.

Cyclical unemployment is directly attributable to the lack of jobs caused by the business cycle (business fluctuation). Cyclical unemployment is unemployment caused by the lack of jobs during a recession. When real (GDP) falls, companies close, jobs disappear, and workers scramble for fewer available jobs.

The Great Depression is an example of cyclical unemployment. There was a sudden decline in consumption, investment, government spending, and net exports. As a result of this fall in real (GDP), the unemployment rate rose.. Great Recession beginning in 2007 is another example of cyclical unemployment. [1]

(3/3/3) Full Employment:

Full employment also called the natural rate of unemployment. Hence, both frictional and structural unemployment are present in good and bad time, full employment does not mean zero percent of unemployment. Full employment is the

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1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – previous reference – P. 127

situation in which an economy operates at an unemployment rate equal to the sum of the frictional and structural unemployment rates. Full employment is the rate of unemployment that exists without cyclical unemployment. Full employment rate changes over time.

Several reasons are given for why full employment is not fixed. One reason is that , the participation of women and teenagers in the labor force increased. This change in the labor force composition increased the full-employment rate of unemployment because both women and young workers typically experience higher unemployment rates than men. Another reason for the rise in the full-employment rate of unemployment is that larger unemployment compensation payments, food stamps, welfare, and Social Security benefits from the government make unemployment less painful. [1]

When people in an economy are unemployed, society forfeits the production of goods and services. To determine how much the society loses if the economy fails to reach the natural rate of unemployment, economists estimate (GDP) gap. (GDP) gap is the difference between actual real (GDP) and full-employment real (GDP). The level of (GDP) that could be produced at full employment is also called potential real (GDP). This can be shown in the following formula: [2]

$$GDP_{gap} = Actual\ Real\ (GDP) - Potential\ Real\ (GDP) \underline{\hspace{2cm}} (10)$$

The (GDP) gap can be either positive if actual real (GDP) exceeds potential real (GDP) or negative if actual real (GDP) is less than potential real (GDP). As the (GDP) gap is calculated on the basis of the difference between (GDP) at the actual unemployment rate and estimated (GDP) at the full-employment rate of unemployment, (GDP) gap measures the cost of cyclical unemployment. A

1) Roger Le Roy Miller – previous reference – P. 148.
2) Michael Melvin and William Boyes , previous reference, p 140 .

positive (GDP) gap measures a boom in the economy when workers are employed overtime, and a negative (GDP) gap increases during a recession.

(3/3/4) Cost of Unemployment:

The burden of unemployment is more than the loss of potential output measured by (GDP) gap. Unemployment also has nonmonetary costs. The effects of unemployment can also linger into the future . Workers who suffer from prolonged period of unemployment are likely to lose some of their skills . This lack of knowledge will make it more difficult for the person to find a job in the future. To families with fixed obligations ,such as mortgage payments , the loss in income can bring immediate hardships. Unemployment insurance ,which are payments received from the government upon becoming unemployed , can cushion the blow to some degree ,but unemployment insurance is typically temporary and does not replace a worker's full earnings. In our society, a person's status and position are largely associated with type of job the person hold. Some people endure unemployment pretty well because they have substantial savings to draw on, but others sink into despair. Losing a job can impose severe psychological costs. Without work, many people lose their feeling of worth. Research has associated high unemployment with suicides, crime, mental illness, heart attacks, and other melodies. Moreover, severe unemployment causes despair, family breakups, and political unrest. [1]

Additional costs of unemployment. The involuntary part- time work varies over the business cycle , increasing during recessions and decreasing during expansion . Part-time employees represent several cost advantages to employer, rarely do they qualify for health or retirement benefits , and they are frequently paid lower wages than full –time workers . Involuntary part-time work has increased significantly in

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1) Mordenchai E. Kreinin – Economics- An introductory Text –Fourth Edition – Michigan State University – 2003 – P. 209.

recent years .The other cost, high unemployment can reduce people prospects for a raise or promotion and tends to generate underemployment .Underemployment occurs when people are forced to take jobs that do not match with their skills or experience. College graduates who drive taxies would be classified as underemployed .Underemployment is detriment to both the individuals and society because low wages mean a low standard of living and lower productivity. Some economists worry that underemployment may be showing a sever increase. If correct ,there are discouraging news for college students. Finally , there is evidence that high unemployment can lead to sluggish productivity growth .When unemployment is high ,firms are reluctant to acquire new machinery or train workers .Productivity growth is the single most important factor determining living standard of candidates . [1]

(3/4) Inflation:

(3/4/1) Definition and concept:

In addition to the goals of full employment and economic growth , keeping prices stable is one of the most important economic goals facing a nation . Inflation is an increase in the general (average) price level of goods and services in the economy for a long period of time . Deflation is a decrease in the general (average) price level of goods and services in the economy, it's the opposite of inflation. [2]

The most widely reported measure of inflation is the consumer price index (CPI), which measures changes in the average prices of consumer goods and services. The (CPI) is sometimes called the cost-of-living index. It includes only consumer goods and services in order to determine how rising prices affect the income of consumers. Unlike the (GDP) chain price index. (CPI) does not consider

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1) Mordenchai E. Kreinin, Previous Reference, P. 210
2) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – Previous Reference – P. 117.

items purchased by businesses and government. The items included in (CPI) are: food, housing ,apparel, transportation, medical care ,entertainment ,and other expenditures.

The chain –weighted index for (GDP) and (CPI) are both measures of average prices of the economy , yet they differ in several ways :First: the (CPI) measures the cost of a typical basket of goods for consumers . It includes goods produced in a prior years (such as older cars) as well as imported goods . The chain- weighted price index for (GDP) does not measure price changes for either used goods or imports. [1]

To calculate the consumer price index (CPI), determine the cost of the same market basket valued at current-year prices and compare this to the cost at base-year prices. Abase year is a year chosen as a reference point for comparison with some earlier or later year. This is expressed as a general formula:

$$CPI = 100 \times \frac{Cost\ of\ Market\ Basket\ of\ Products\ at\ Current\ Year\ prices}{Cost\ of\ Market\ Basket\ of\ Products\ at\ Base\ Year\ prices} \quad\text{------- (11)}$$

Annual rate of inflation, is computed as the percentage in the official (CPI).

$$Annual\ Rate\ of\ Inflation = 100x \frac{CPI\ in\ the\ current\ Year - CPI\ in\ Previous\ Year}{CPI\ in\ Previous\ Year} \_(12)$$

Negative Inflation rate was a deflation.

Disinflation is a reduction in the rate of inflation. Disinflation does not mean that the prices are falling , it means that the rate of increase in prices is falling.

The consumer prices index is not a perfect measure of inflation. There are some reasons for this criticism:

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1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – Previous Reference – P. 130.

1. Changes in the (CPI) are based on a typical market basket of products that does not match the actual market basket purchased by many consumers.

2. It has difficulty in adjusting (CPI) for changes in quality. A portion of the price increase ,therefore reflects better quality instead of simply a higher price for the same item . If quality of the item improves, increase in (CPI) overstate inflation .Similarly , deteriorating quality understate inflation.

3. It ignores the relationship between price changes and the importance of items in the market basket. If the price of a product rises, consumers purchase substitutes, and a smaller quantity is demanded. [1]

(3/4/2) Consequences of Inflation:

This part examines the effect of inflation on people's income and wealth. Inflation is feared because it can significantly alter one's standard of living . Inflation can create winners ,who enjoy a larger portion of the national income pie, and losers , who receive a smaller portion as a result of inflation.

(3/4/2-a) Inflation and Income:

When prices rise, people worry whether the rise in their income will keep pace with inflation. And the more quickly prices rise, the more people suffer from the stresses of inflation and its uncertainties.

Inflation tends to reduce the standard of living through declines in the purchasing power of money. The greater the rate of inflation, the greater the decline in the quantity of goods we can purchase with a given nominal income, or money income. Nominal income is the actual number of dollars received over a period of time. The source of income can be wages, salary, rent, dividends, interest, or pensions. Real income is the actual number of dollars received (nominal income) adjusted for changes in the (CPI). Real income measures the amount of goods and

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1) Arthur O' Sullivan, Steven M. Sheffrin and Stephen J. Perez – Previous Reference – P. 131.

services that can be purchased with one's nominal income. If the (CPI) increases and the nominal income remains constant, the real income (purchasing power) falls. When the nominal income fails to keep pace with inflation, the standard of living falls. To calculate the real income, the formula below is used:

$$Real\ Income = \frac{Nominal\ Income}{CPI\ (as\ decimal\ CPI/100)} \underline{\hspace{2cm}} (13)$$

Where :CPI :consumer price index.

Workers with union contracts are largely unaffected by inflation because their wages automatically increase with increase in the (CPI), which is called a cost-of-living adjustment. People whose nominal incomes rise faster than the rate of inflation gain purchasing power , while people whose nominal incomes do not keep pace with inflation lose purchasing power.

(3/4/2-b) Inflation and Wealth:

Income is one measure of economic well-being ,and wealth is another . Income is a flow of money earned by selling factors of production. Wealth is the value of the stock of assets owned at some point in time. Wealth includes real estate, stocks, bonds, bank accounts, life insurance policies, cash, and automobiles. A person can have a high income and little wealth, or great wealth and little income.

Inflation can benefit holders of wealth because the value of assets tends to increase as prices rise. On the other hand, the impact of inflation on wealth penalizes people without it,e .g; younger people. As prices rise, it becomes more difficult for them to buy a house or acquire other assets.

(3/4/2-c) Inflation and The Real Interest Rate:

Borrowers and savers may be winners or losers, depending on the rate of inflation. This will happen when we distinguish between the nominal interest rate and the real interest rate. The nominal interest rate is the actual rate of interest

earned over a period of time. It is the interest rate specified on a loan or investment account. The real interest rate is the nominal interest rate minus the inflation rate. The occurrence of inflation means that the real rate of interest will be less than the nominal interest rate. When the real rate of interest is negative, lenders and savers lose, because interest earned does not keep up with the inflation rate. Nominal interest rate can never be negative, but the real interest rate can be either positive or negative. [1]

(3/4/3) Types of Inflation:

Economists distinguish between two basic types of inflation, depending on whether it originates from the buyers' or the sellers' side of the market .Which are:

(3/4/3-a) Demand-pull Inflation:

Demand-pull inflation is the most familiar type of inflation, which is a rise in the general price level resulting from an excess of total spending (demand). Demand-pull inflation is often expressed as "too much money chasing too few goods." When sellers are unable to supply all the goods and services buyers demand, sellers respond by raising prices. The general price level in the economy is "pulled up" by the pressure from buyers' total expenditures. Demand-pull inflation occurs at or close to full employment, when the economy is operating at or near full capacity. At full employment all but the frictionally and structurally unemployed are working and earning income.

Therefore, total or aggregate demand for goods and services is high. Businesses find it profitable to expand their plants and production to meet the buyers' demand, but this cannot occur in the short run. As a result, national output remains fixed, and prices rise as buyers try to outbid one another for the available supply of goods and services. If total spending subsides, so will the pressure on the available supply of products, and prices will not rise as rapidly or may even fall. In this type of

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1) Roger Le Roy Miller – Previous Reference – P. 154

inflation the consumers may not be only villain. The total aggregate spending includes consumer spending, business investments, government spending, and net exports .All may contribute to inflation. [1]

Figure (3/4): Annual Inflation Rates in Selected Countries, 2009
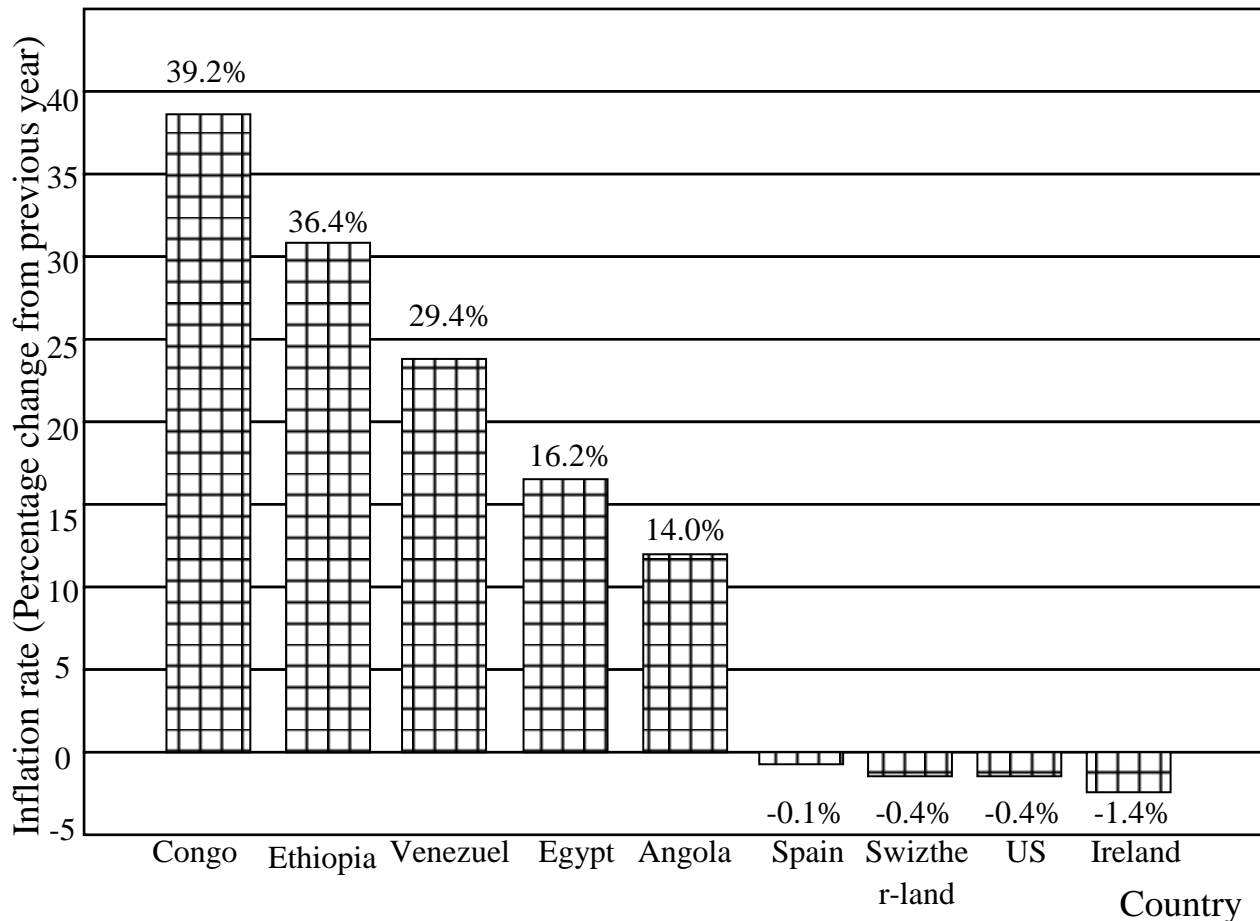
As shown by the bars, inflation was a serious problem in 2009 for Congo, Ethiopia, Venezuela and other countries. The United State, Ireland, and other countries have negative inflation rates.

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1) Michael Melvin and William Boyes , Previous Reference, p 139.

Figure (3/5): Demand-Pull Inflation
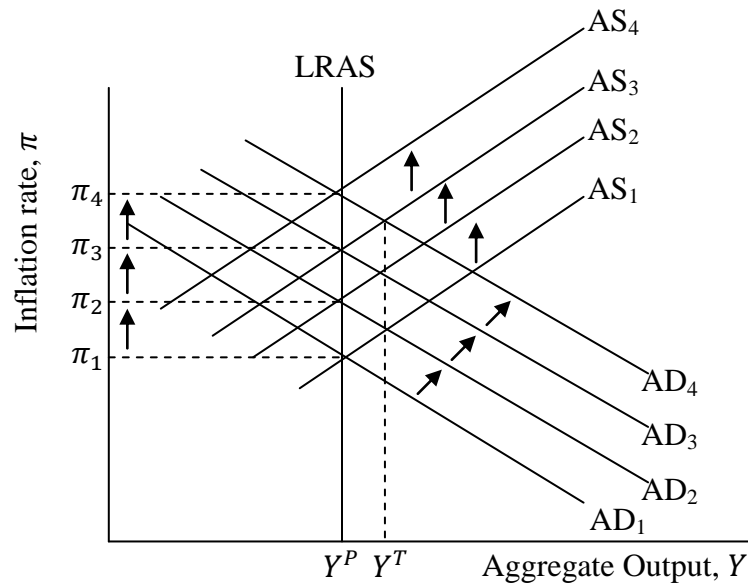
Source: Michael Melvin and William Boyes , Previous reference.

Too low an unemployment target, too high an output target (Y^T) , causes the government to increase aggregate demand, shifting (AD) curve rightward from $(AD_{1)}$ to (AD_2) to (AD_3) and so on. Because the unemployment rate is below natural rate level, wages will rise and the short-run aggregate supply curve will shift up and to the left from (AS_1) to $(AS_2$) to (AS_3) and so on. The result is a continuing rise in inflation which is demand-pull inflation.

(3/4/3-b) Cost-Push Inflation:

Cost-push inflation is a rise in the general price level resulting from an increase in the cost of production. Any sharp increase in costs to businesses can be potential source of cost-push inflation. This means that upward pressure on prices can be caused by cost increases for labor, raw materials, construction, equipments, borrowing, and so on. Businesses can also contribute to cost-push inflation by raising prices to increase profits.

The influence of expectations on both demand-pull and cost-push inflation is an important consideration. Suppose buyers see prices rise and believe they should purchase that new house or car today, before these items cost much more tomorrow. At or near full employment, this demand-pull results in a rise in prices. On the suppliers' side, firms might expect their production costs to rise in the future, so they raise prices in anticipation of the higher costs. The result is cost-push inflation. [1]

When there is an extremely rapid rise in the general price level, this is called hyperinflation. There is no consensus on when a particular rate of inflation becomes "hyper." However, most economists would agree that an inflation rate of about 100 percent per year or more is hyperinflation. Inflation is conducive to rapid and violent social and political change stemming from four causes:

First: Individuals and businesses develop an inflation psychosis, causing them to buy quickly today in order to avoid paying even more tomorrow. Everyone feels pressure to spend their earnings before their purchasing power deteriorates.

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1) Michael Melvin and William Boyes , Previous Reference, p 78

Figure (3/6): Cost-Push Inflation
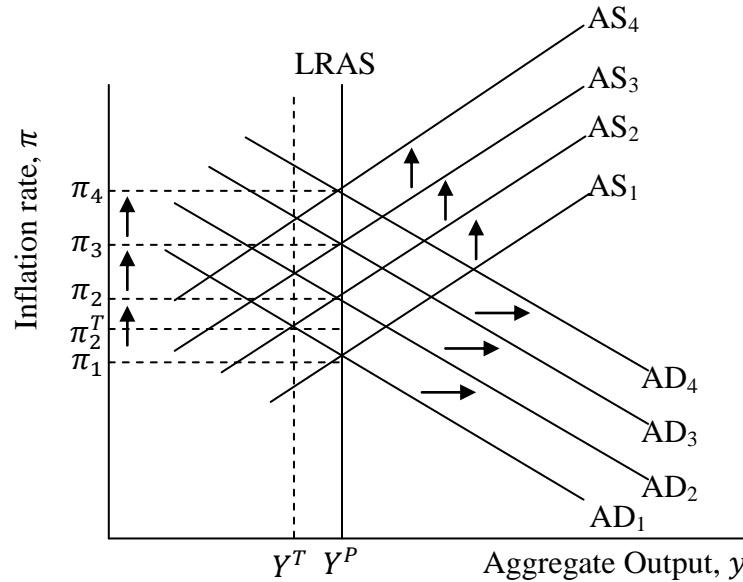
Source: Michael Melvin and William Boyes , previous reference.

A cost-push inflation , which acts like a temporary negative supply shock, shifts the short-run aggregate supply curve up to the left to (AS_2) , and the economy moves to point (2). To keep aggregate output at Y^P and lower the unemployment rate, policy makers shift the aggregate demand curve to (AD_2), so that the economy will return quickly to potential output (Y^P) at point (2) and inflation rate of π_2 .

Further upward and downward shifts of (AS_2) to (AS_3) and so on, cause policy makers to keep on increasing aggregate demand, leading to continuing increase inflation which is a cost-push inflation. [1]

Second: Huge unanticipated inflation jeopardizes debtor-lender contracts, such as credit cards, house mortgages, life insurance policies, pensions, bonds, and other forms of savings. For example, if nominal interest rates rise unexpectedly in response of higher inflation, borrowers find it more difficult to make their monthly payments.

1) Michael Melvin and William Boyes , Previous Reference, p 79.

Third: Hyperinflation sets a wage-price spiral in motion. A wage-price spiral occurs in a series of steps when increases in nominal wage rates are passed on in higher prices, which, in turn, result in even higher nominal wage rates and prices.

A wage-price spiral continues when management believes it can boost prices faster than the rise in labor costs. As the cost of living moves higher, however, labor must again demand higher wage increases. Each round yields higher and higher prices as wages and prices chase each other in an upward spiral.

Fourth: Hence, the future rate of inflation is difficult or impossible to anticipate, people turn to more speculative investments that might yield higher financial returns. To hedge against the high losses of purchasing power from hyperinflation, funds flow into gold, silver, stamps, jewels, art, antiques, and other currencies, rather than into new factories, machinery, and technological research, which expand an economy's production possibilities curve. [1]

One of the most famous hyperinflation occurred during the 1920s in the German Weimar Republic[2]. Faced with huge World War I reparations payments, the Weimar government simply printed money to pay its bills. By late 1923, the annual inflation rate in Germany had reached 35,000 percent per month. Prices rose frequently, sometimes increasing in minutes, and German currency became so worthless that it was used as kindling for stoves. No one was willing to make, new loans, and credit markets collapsed. Wealth was redistributed as those who were heavily in debt easily paid their debts, and people's savings were wiped out.

Finally: Hyperinflation is invariably the result of a government's ill-advised decision to increase a country's money supply.

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1) Michael Melvin and William Boyes , Previous Reference, p 81
2) Irvin B. Tucher, previous reference, P. 199.

(3/4/4) The Cost of Inflation:

Economist separate costs of inflation into two categories. One includes cost associated with fully expected or anticipated inflation . The other includes the costs associated with unexpected or unanticipated inflation.

(3/4/4-a) Anticipated Inflation:

Efficiency or (welfare)costs, even if wages , taxes, and interest rates kept pace with inflation ,society would still incur what economists call welfare costs. The term welfare refers to economic efficiency not transfer payments or aid for the needy. At least two welfare costs are associated with even perfectly anticipated inflation. The first: involves cash management . When inflation is high, the purchasing power of cash depreciate rapidly. To maintain the value of their financial wealth, people engage in active cash management ;that is they make more trip to the bank to minimize their cash holdings and maximize the amount of money kept in interest-earning accounts .Corporations find themselves devoting extra effort to financial matters instead of productive activities. From society's perspective, such efforts are inefficient and wasteful because little tangible is produced. [1]

Menu Costs are a second welfare cost of perfectly anticipated inflation .Inflation forces firms to spend extra time and effort changing prices on menus, catalogs, and other lists. There is no good way to estimate the menu costs of inflation , but they are probably a major source of the frustration that consumers feel from inflation : it is no fun to see higher prices every time people go into their favorite store.

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1) Williams S. Brown – Principles of Economic – USA – West Publishing Company – 1995 – P. 701

(3/4/4-b) Unanticipated Inflation:

It is very difficult to forecast future inflation accurately so inflationary "surprises" are common . When inflation is not perfectly anticipated, it imposes several additional costs on society . The cost of unanticipated inflation include income redistribution, the disincentive to save , tax distortions , and market inefficiency.

Income Redistribution:

Unanticipated inflation can lead to a redistribution of income. When nominal interest rates are not indexed ,inflation that is higher than anticipated causes real interest rate to fall below the rate that is desired. This results in a redistribution of purchasing power from lenders to borrowers because loans are repaid with less valuable dollars than were borrowed .Corporations and government gain from inflation too . Inflation allows corporation to pay dividends and redeem bonds with less valuable dollars . The government retires the national debt with cheaper dollars . In fact, some people have argued that the government prints money and uses inflation to reduce the real value of its existing debt instead of raising taxes, this practice is often called an inflation tax. Because lenders tend to be from upper income brackets and borrowers are often from the middle class, inflation may redistribute income toward the middle class. Groups in the very lowest income welfare and Social Security recipients- may not be hurt by inflation if their entitlement checks are indexed to consumer price inflation ,through only some checks are indexed to the inflation rate . [1]

Disincentive to Save:

Low real interest rates can act as a disincentive to save . Economists believe that people save more at high interest rates than at low interest rates, because high

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1) Williams S. Brown – Previous Reference – P. 702

interest rates make saving grow faster. Periods of low real interest rates are the best times to borrow for that new car or house, and borrowing is an act of not saving .

Tax Distortions:

Inflation adversely affects business taxes . Taxes are also levied against nominal instead of real capital gains .Taxes also levied against the nominal interest return on saving instead of the real interest return .Taxing the real return on saving would reduce tax liability and thus encourage saving.

Other cost of inflation that, If unanticipated inflation becomes extreme, individual will spend more time trying to benefit from inflation rather than working at productive jobs. Many people devoted their time to speculation in real estate and commodity markets to try to beat inflation ,and the economy become less efficient. Even in less extreme cases . The cost of inflation is compounded as inflation rises. At high inflation rates, these costs grow rapidly ,and at some point policy- makers are forced to take actions to reduce inflation. [1]

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1) Williams S. Brown – Previous Reference – P. 703

CHAPTER FOUR

FEATURES OF SUDANESE ECONOMY AND SOME MACRO-ECONOMIC VARIABLES

CHAPTER FOUR

FEATURES OF SUDANESE ECONOMY AND SOME MACRO-ECONOMIC VARIABLES

Sudanese economy reflected to a great extend the economy of developing countries. All the developing countries have the same features of the economy and social life. The Sudan has large areas of land which is suitable for agricultural production, adequate water resource, human resources, and other natural resources, but still in the latest level in the list of developing countries.

The Sudanese economy is recognized by the weakness of the structure of the economy compared with developed and industrial countries. There are many factors which affect the growth of the Sudanese economy, some are exogenous which are the war in Southern Sudan, changes in climate, drought, floods, desertification and refugees from neighbor countries.

The endogenous factors affecting Sudanese economy are the economic policies that lead to upset between the aggregate supply and aggregate demand, the negative developments in inflation rate and exchange rate.

Therefore, the Sudanese economy suffered from long periods of reduction in real income, deterioration in infrastructures and large deficit in food security.

This situation resulted in gradual deterioration which continue for a long time. The result of this deterioration was the expansion in aggregate demand that lead to a short-run borrowing from external and internal resources, deformity in the economy, imbalanced in resource distribution and stagnancy in all sectors, specially the productive sectors.

The study of macro-economic variables for any country, reflects the performance of the economy and the interaction between the aggregate supply and

aggregate demand. The most important of these variables are: inflation rate, exchange rate, the current account, and the gross domestic product. Change in any of these variables however, will lead to instability of the economy.

The most important variable, is the gross domestic product (GDP). The knowledge of the gross domestic product helps in showing the real image of the national economy. (GDP) of the Sudanese economy increased in the last years since 1965 except in few years. But, the increase of (GDP) was in low and slow growth rate. The main feature of (GDP) in the period 1970 – 1996, was highly fluctuated from year to year. The growth rate of (GDP) was about -7.8% in 1973, -6.3% in 1985, +22.3% in 1976 and +14.6% in 1982. This fluctuation in (GDP) was due to changes in the rate of rainfall and drought in 1984 – 1985. The relationship between (GDP) and the rainfall is that the Sudanese economy depends mainly on the agricultural sector which represents the large section of (GDP) and contributed by more than 40% of (GDP) yearly. The agricultural sector contributed by high ratio in (GDP), about 34.7% in 1970 and 45% in 1997. The second feature of (GDP), is slow and low in growth rate, which did not exceed 2.9% during the period 1970 – 1995. The third feature of (GDP) is the relationship between the agricultural sector and other productive sectors like the industrial sector, transportation sector, and trade sector. Therefore, the weak and fluctuated performance of the agricultural sector is the main factor that influenced and led to low and slow growth rate of (GDP). [1]

The second macro-economic indicator is the inflation. The important factor that affect the inflation rate in the balance of general budget specially the volume of budget deficit and how to finance it. There are two main sources to finance the budget deficit, first: borrowing from banking system or liquidation of foreign fund.

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1) Abdul Wahab Othman, Methodology of Economic Reform in Sudan, Khartoum, Currency Printing Co.ltd -2002- pp. 112 – 113 .

These two sources are the main sources of liquidity in the economy and are the main sources of high inflation rate. Inflation rate increased rapidly since 1970 to reach 121% in 1991, that led to rapid and continuous deterioration in the economy. During this period the budget deficit expanded and increased during 1976 – 1989 to reach 10% from the (GDP). There was mortal excess in real expenditure side coincided with deterioration in general returns which led to continuous deficit in general budget and turning to cover it by borrowing from banking system. This give rise to great changes in the economy. [1]

The third macro-economic variable is the balance of payments. The balance of payments represent the result of the performance in external economic activities, exports, imports, external transfers and capital movements. The balance of payments is the mirror of economic activities in production, investment, and savings. It react positively or negatively with economic frame-work situations, deterioration in current account in the Sudanese economy began since 1970s, due to external and internal elements like:

- Slow and low growth rate in production, specially the basic export commodities.
- High expenditure rates in both general and private sectors that financed by borrowing from external and local sources.
- Non real and discouraging exchange rate for both exports and imports.
- Lack of skilled labor because of migration.
- Increase in prices of most of import commodities specially, the price of petroleum products and agricultural production inputs.
- Continuous increases in service burdens of external debt and growth in indebtedness of the Sudan.

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1) Abdul Wahab Othman, previous reference, p. 82

The imbalance in aggregate supply lead to decline in production, the production for exports influence balance of payments and the government unable to repay foreign debts and as a result the flow of loans from abroad stopped.

The fourth macro-economic variable is unemployment. The data of the population census in the year 1973, indicated that, the rate of unemployment of the labor force reached 6.3%. This rate of unemployment is the lowest rate compared to some other developing countries. [1]

The World Labor Organization , in its report of working in Sudan in the year 1975, mentioned that, the unemployment in the Sudan decreased compared to some developing countries and also in rural areas than cities. The rate of unemployment increased among the people that did not have any training or skills. Although, the Sudan is in the beginning of the way to development and utilization of resources, there is potentiality to accommodate professionals, and technicians and high skilled labor.

During 1970s, labor force supply was less than the demand for labor in modern sectors. However, there was expansion in the modern production activities, especially, the industry that needed technical and skilled labor. This lead to an increase in demand for labor.

The pressure of unemployment expected to appear in unskilled labor. To organize the labor market, the agency of labor constructed some offices in the states to register the researchers for work and attempted to employ them in the general and private sectors. As a result of stress that faced the Sudanese economy since 1978, lack of productivity in agricultural and industrial projects, the capability of economic sectors to accommodate the labor force become weak and so, the unemployment worsening gradually.

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1) Othman Ibrahim Al Sayed- The Sudanese Economy- Sudan – The General Corporation for Printing and Publishing- 199- P. 36.

The statistics in the year 1983, indicated that the numbers and rates of unemployment for age groups of 10 years and over and according to sex:

Table (4/1): Unemployment Rate According to Sex in 1983

sex	Labor Force	Unemployment	Unemployment Rate
Male	4489561	443213	9.9%
Female	1842431	222371	13.4%
Total of labor force	6332992	665584	10.59%

Source: Economic Review ,National Committee for Population .

During the ten years 1972 – 1983, the rate of unemployment rates increased in all the states. Also, the numbers of refugees increased and so the unemployment rate because of great number of refugees who are economically active and they competed the nationals in labor market. The unemployment problem did not limited to unskilled labor or in labor sector, but, extended to the university and high institutions graduates.

The weak rate of assimilation of the graduates into the public civil service, indicate that the decline of the government vacancies as employer and the graduates have two choices, direction to the private sector or the migration to other countries to attain a better life. The appearance of unemployment in the economy especially the unemployment of the graduates and skilled labor indicated the trouble or weakness in the economy and disability to expand in industry and modern sectors to employ additional labor force. Also, this situation indicated the lack of coordination between the education policies and training and according to the need of the labor market. Therefore, encouraging investment in private sector to expand the economic base to create new opportunities of work. Also, connected the output of education in all colleges with the actual needs of the economy in different sectors to provide suitable labor force.

The fifth variable is money supply . Money is a basic variable in the Sudanese economy as well as other economies .Money supply (M2), is broadly defined as: the currency with the public ,demand deposits and quasi-money(margins on documentary letters of credit, and letters of guarantee, time deposits, and investment deposits). Whereas the narrow definition of money supply (M1), includes currency with the public and demand deposits. Monetary base (reserve money) ,consists of currency in circulation outside the Central Bank of Sudan (currency with the public and currency with commercial banks),commercial banks' reserves and demand deposits with the Central Bank .It was known that monetary base which represents the operational target for the Central Bank of Sudan through which expansionary or contractionary monetary policy operations are implemented,

and based on the relationship between monetary base and money multiplier the ultimate effect on the volume of money supply is determined.

Money supply consists of currency in circulation and deposits ,also, equal to monetary base multiplied by money multiplier .There are three parts that determine and affect money supply which are the Central Bank , the commercial banks ,and the public behavior .The public prefer cash money to deposits .The commercial banks impact is by creating money from deposits .The Central Bank affect through the reserves (monetary base). Money authority determine the legal reserves requirements that were imposed up on the banking system.

The Central Bank uses many instruments to regulate the liquidity and control the finance to mobilize the economic activities . As a result of the banking system development ,this reflected in the Central Bank change to use the indirect instruments and use the certificates in open market operations. Instruments that Central Bank uses to implement monetary policy are :Legal Reserves, Internal Liquidity Ratio , Profit Sharing (Murabaha Margins) and Participation Ratio, The

Central Bank (Ijara) Certificates (CBICs) and Government partnership (Musharaka) Certificates(GMCs), Foreign Currency Operations, The Central Bank as the lender of last resort, and Moral Suasion.

Banking System in Sudan:

The banking system in Sudan ,began after the independence in 1956. In the colonial period the currency was paper and coins for the two colonial countries since 1900. The first bank established in Khartoum was the Egyptian National bank, that worked as an agent in financial operations for the government and as a lender of last resort for the foreign commercial banks. In the year 1956, the foreign currency substituted by Sudanese currency to strengthen the independence.

The structure of banking system in the Sudan is a simple structure like that of all developing countries, it consists of three main types:

1. The Central Bank, is at the top of the banking system and governs it.
2. Commercial banks.
3. Few number of development banks or specialized ones.

The first and second group of banking system, in addition to the other functions, they are responsible for creating the total supplies of money and the purchasing power. The third group is specialized in performing the development in special areas and sectors. The historical development of the Sudanese banking system passed through seven stages which were as follows:

The first stage: Is the stage of commercial bank (braches of foreign banks) which began in 1903. The first commercial bank in the Sudan was the Egyptian National Bank, established in the year 1903. Came after it, the Barclays Bank in the year 1913.The foreign banks worked to attract savings and finance the foreign trade to gain profits and transfer the surplus to their original countries .The other foreign banks during this period were :

- Othman Bank as English –Turkey Bank (1946).

- Credit Lunaae (1953).

- Egypt Bank (1953).

- Jordan –Arabic Bank (1956).

- Ethiopian Bank (1956).

The second stage: Is the stage of Sudanese national banks and specialized banks in the period 1960 – 1970.

The Sudanese Commercial Bank is the first bank in the Sudan opened in 1960. Also, the French Bank, Credit-lunaae transferred to Al-Neleen Bank as Sudanese-French co-operation. However, the specialized banks are the Agricultural Bank opened in the year 1959, to finance the agricultural operations. Also, the Real Estate Bank which aimed to provide suitable residence for all citizens. [1]

- **The third stage:** Is the stage of establishing the Bank of Sudan which opened in the year 1960 and started its duties as Central Bank of the Sudan.

- **Fourth stage:** Is the stage of development national banks, which are the Industrial Bank in the year 1963, The Sudanese Development Organization in the year 1974 and the Investment Bank in the year 1972.

- **Fifth stage:** The stage of nationalization of commercial banks in the year 1970.

- Sixth stage, the stage of the liberality in the year 1976, in which the foreign banks started to perform their activities like Abu Dhabi National Bank, City Bank and others.

- **Seventh stage:** The stage of application of the Islamic banking system in the year 1984. Transferred from the traditional banking system to the Islamic one.[2]

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1) Mohammed Farah Abdul Haleem- The Fiscal and Banking Development in the Sudan- Sudan-International Company for Printing and Publishing- 2005- P.71.
2) Mohammed Farah Abdul Haleem, previous reference- P.73.

In the year 1991/1992 ,began the actual application of the Islamic banking system .Also, this period witnessed an important economic developments which were represented as follows:

- The Third Year Salvation Program.
- The Law of organizing the banking system .
- Establishment of High Organization of Superintendence Legality for banking system and financial institutions.
- Status Restoration Program .
- Liberalization of foreign currency.
- Establishment of Khartoum Stock Exchange Market.

The Central Bank of Sudan :

The function of the Central Bank of Sudan according to Article (6) of 2002 Act, (amended 2012) were summarized in :

- Maintaining the stability of the exchange rate and efficiency of the banking system.
- Issuing currencies in different denominations.
- Organizing ,supervising ,controlling of and working towards upgrading , developing ,and enhancing banking business efficiency in a manner that contributes to the attainment of balanced economic and social development.
- Acting as the government's bank and its advisor ,and agent in the financial and monetary affairs.

The relationship between the Central Bank and the government is that, the Central Bank works as an agent and advisor. Also , the Central Bank issues the government bonds and can buy and sell these bonds .Also, the government

deposits all the treasury in the Central Bank .The relationship between the Central Bank and the commercial banks is that, the Central Bank is the main management section that competent by supervision and superintendence of the other banks. Also, the Central Bank is the holder of greater part of the commercial banks' stocks.

The Central Bank policies aimed at achieving the goals set under the Three-Years Economic Program ,particularly ,maintaining the economic stability and restoring external and internal balance. The policies focused on maintaining monetary stability, mobilization of domestic resources and national savings and reallocating these resources to finance production of the necessary goods in the context of import substitution and exports production .These policies would not only help in easing the pressure upon foreign resources to meet the external commitments headed by the importation of strategic goods. The branches of the Central Bank increased from 15 branches in the year 2012 to 16 branches in the year 2013, distributed in the different states of Sudan.

Since 1969, at the beginning of May period, it began a new stage of planning and investment. The new government began to change the economic manner from capitalistic to socialistic system .May government setup the first plan, that is called the Five Years Plan 1970 – 1975, which depended on generalization in management and centralization in planning and execution, monopolization of most of the investment and trade activities by general corporations. This plan had been revised and extended during the period from 1970 to 1983 and the two plans contained broad goals to reform the economy. The main and broad goal of the plan was carrying out self-sufficiency in agricultural production and preparing of surplus for export. Although, there was huge financial potential for this plan, but did not give fruit, because of weak design of projects, slow execution and

instability of the economy. Unstable exchange rate and high inflation rate created an environment that did not promote production and investment. After that, the government setting the Four Years Program 1988/1989 – 1991/1992[1].Before the application of this program, the authorization of the Sudan changed and came the National Salvation Government. In October, 1989, the conference of comprehensive economic salvation was held. Based on the recommendations of that conference, the Three Years Program of economic salvation for the period 1990 – 1993 was prepared. The main goals of the program were:

- Mobilization of the stagnation of the economy which was directed it towards production.
- Crowding all available powers externally and internally to contribute in carrying out the goals of the program and revise the economic framework.
- Achieving the social stability.
- Removal of all economic, legal, and managerial difficulties that discourage businessmen, investors, and economists.

The general instruments for this program were: Focusing on improvement and development in agricultural sector and liberalization of exports and introducing subsidy. This program succeeded in the short-run and contributed to remove most of deformation in the Sudanese economy. This was because of economic liberalization policy in trade which will repeal all difficulties in exports and imports .The main goal of economic liberalization policy was to achieve two requirements:

- Economic domination and directing the economy to be up-to date and meet the goals of salvation program, and this came under the political economic framework. This can be done by directing the human resources and other

resources towards the different production sectors to serve the government strategies.

- Liberalization of market forces. This was done by removing all restraints that interrupted these forces, this lead to achievement of full competition which lead to price decrease.

This program did not succeed in achieving the stability of the economy and permanent growth rate in the medium-term because of:

- The program restricted on structural reform without connection with comprehensive macro-economic reform, especially in fiscal and monetary sectors. This result in failure to achieve the goal in economic reform and permanent growth. Because of the decrease in external assistance flows and the program dependence on local resources by expanding the volume of liquidity. This lead to large upset in fiscal and monetary policies, this result in high stress on the aggregate demand, high inflation rates and devaluation of national currency.
- Appearance of multiple exchange rate and the government assisting on the unrealistic exchange rate, with the acceleration of surprise of inflation rates. Therefore, the private sector has no confidence in economic policies.
- The drought during 1991 – 1992, affected the agricultural production.
- The impact of finance for Economic Structural Reform Program which was reflected on the society exceeded the expectations of the program.
- The program did not succeed to pull out the economy from low production field, because of discourage for the private sector to buy the privatized corporations for privatization. Therefore, the government transferred these corporations to the state governments or trade unions and associations.

In spite of the negative performance of this program in macro-economic side, this program succeeded in qualitative side especially in the life way, education, and culture. This, besides the expansion in higher education institutions. Also, the development of authority from federal to regional authority and expansion in the number of states and localities .

The Comprehensive National Strategy 1992 – 2002, was settled after the Economic Salvation Program. The strategy intended to set intellectual and systematic framework to build the great Sudan by the end of the year 2002. The strategy depended on comprehensive visions and consecutive and regular cycle between the economic growth rate and the financial, monetary and trade policies and social development. Also, the strategy contained the complete movement of the society in many fields, politics, security, civilization, culture and mass media. There are three programs to perform this strategy:

The first program was performed during the period 1992 – 1995. The second, during the period 1996 – 1998. The third during the period 1999 – 2002. Then the program for the period 2003 – 2006. After this period, the Sudan witnessed the generation of Strategic Planning that began in the year 2007 to the year 2031. This period has been divided into five years period began in 2007 – 2011.

The second program of National Strategy began during the period 1996 – 1998. This period recognized in Sudanese economy and human life by beginning the structural changes in the economy. Wherever this period witnessed real development in petroleum production. There was an international and regional recognition for discovering petrol. (1)

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1) Haider Babker Al Rayah- The Sudanese Economy in 58 Years (1953/54 – 2011/12)-Sudan-Dar Azzah for Printing and Distributing- 2012-P.181.

Sudan became an attractive country for African countries that have borders with it and for foreign investment. The petroleum products become important commodities in exports and represent the main source of hard currency. The government take care of the petroleum sector, because it solve many production problems. During this period, (GDP) recorded growth rate of 6.1% in 1997, this growth rate was due to increase in agricultural production, industry and mining. In 1998,(GDP) decreased to 6%. There was enhancement of rationalization in aggregate demand to carry out the economic stability by increasing aggregate supply through monetary and fiscal policies as well as institutional measurements. In addition to allocate some financial resources of the general budget to increase production as stated in the goals of 1998 program.

Table (4/2) :Some Macro-economic Variables during (1997 – 2002)

Year Items	1997	1998	1999	2000	2001	2002
Gross domestic product growth rate	6.10	6.00	6.00	8.00	6.00	6.00
Inflation rate	46.50	17.51	16.16	8.02	4.90	8.30
Unemployment rate	13.50	13.00	12.50	15.20	15.00	15.90
Balance of payments	-24.00	16.00	110.00	-108.00	127.60	-300.03

Source: Prepared by the researcher from: Central Bank of the Sudan Annual Reports, different issues.

The Sudanese economy responded to these measurements and stopped the deterioration in the end of 1996. There were positive results during this period which were:

- Maintaining of real economic growth which reached in average about 6.35%.

- Inflation rate decreased from 166% in August 1996 to 133% at the end of 1996. It reached about 17% in the end of 1998.

- The deficit in current account of the balance of payment decreased from 8% of total (GDP) in 1996 to 4% in the year 1998.

- Decrease of finance by deficit in general budget from 3.1% from total (GDP) in the year 1996 to 0.5% in the year 1998.

- Decrease of the growth rate of monetary base from 65% in the year1996 to 19% in the year 1998, and decrease of the growth rate of reserves from 79% in the period 1992 – 1997, to 29% at the end of the year 1998.

- Increase of the finance ratio for the private sector from the available finance sources.

- Increase the quantity of exports and current transfers.

The third program made the economy ready for the Economic Adjustment Program. This program performed during the period 1999 – 2002, as a component of the National Strategy. A comprehensive program means the linkage between the continuation of structural reform which was represented in economic liberalization that was synchronized with economic adjustment program. The implementation of structural reform policy alone without the comprehensive macro-economic program will lead to trouble in macro-economic trend, uncontrollable changes in inflation rate, instability of exchange rate and devaluation in national currency. It also, intensify the deficit in current account and balance of payments. To achieve the goals of the program, the economic adjustment program depended on the following policies. [1]

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1) Abdul Wahab Othman, previous reference, P. 232.

- Control the growth of monetary base by the balance between liquidity and low inflation rate.

- Gradual decrease of government borrowing from the banking system.

- Maintaining of real and flexible exchange rate to support the competitive ability for export commodities in foreign markets.

- Raise the social development in education, health, providing pure water and fight poverty.

The goals of this program were:

- Maintaining of positive growth rate in Sudanese economy at a range of 6% to 6.5% annually.

- Decrease of inflation rate to 5% in 2001.

- Decrease the deficit in external balance by 2% of (GDP) by the end of 2001.

- Construction of reserves in foreign currency and increase of payments for external debts to improve the relationship with the foreign companies.

- Rehabilitation of infrastructure by increasing the expenditure on development in national currency by 1% - 2% of (GDP). During the period of the Program, the growth rate of (GDP) was about 6% in average during all the period. The inflation rate decreased to reach 8.3% in the year 2002. [1]

The monetary system reforms during this period focused on employing the government certificates (Sukouk) as a tool of open market operations. These certificates (Sukouk) represented in: Government Musharaka Certificates (GMCs), Government Investment Certificate (CICs). Also, decreased the legal reserves of the commercial banks gradually during this period. Also, enhancement of Central

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1) Abdul Wahab Othman, previous reference, P. 232.

Bank role in controlling the liquidity situation of the commercial banks and creating liquidity rate In these banks.

During the period 2003 – 2006, the agricultural sector represented the leading sector in the economy that contributed by 50% of (GDP). Petroleum products came first in the export commodities. The petroleum exports changed the Sudanese exports structure. The total production of petroleum products increased from 2789.1 metric tons in 2003 to 3160.8 metric tons in 2004 at percentage increase of 13.3%. Petroleum products increased from 3174.8 thousand metric tons in the year 2005, to 3911.8 thousand metric in the year 2006, at a rate of 32.2%. (GDP) increased from 6% in 2003 to 11.00% in the year 2004, and this was due to the growth in economic production sectors except the agricultural sector and transfer industries. The inflation rate decreased from 8.5% in the year 2004 to 7.2% in the year 2006. [1]

Table (4/3):Some Macro-economic Variables during (2003 – 2006)

Year Items	2003	2004	2005	2006
Gross domestic product growth rate	6.00	11.00	6.00	9.30
Inflation rate	7.70	8.50	8.50	7.2
Unemployment rate	15.80	16.20	17.00	17.50
Balance of payments	-422.54	-730.18	530.53	526.33

Source: Prepared by the researcher from: Central Bank of the Sudan Annual Reports, different issues.

The period of Comprehensive National Strategy witnessed the price liberalization policy, petroleum production and export, construction of

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1) Abdul Wahab Othman, previous reference, P. 233.

infrastructure and increased in Gross National Production (GNP) and inflation rate. As a result of combating measure, inflation decreased, but, there was continuation in price rise with decreasing rate which the economists called disinflation. The period 2005 – 2011, recognized by creeping inflation. After the year 2012, there was stagflation because of the failure in the agricultural and industrial sectors and increased unemployment rate. [1]

The First- Five Years Program of the Strategic Planning began in the year 2007 to 2011 and the main goals of this plan depend on economic, social, political, cultural and environmental development, besides the perfect utilization of resources.

Although the Sudanese economy influenced by the World Crisis during the first three years of this plan, but, it continued to grow in different rates in all sectors.

The international rise in oil prices, led to the increase in oil earnings, which contributed greatly to the public budget finance, and increase in the petroleum exports volume. This led to increase in gross domestic product growth rate from 9.3% in the year 2006 to 10.5% at the end of the year 2007. [2]

Monetary and credit policy for the year 2007, in coordination with fiscal and other related policies, were aimed to achieve the objectives of the macro-economic policies which were collectively achieving 10% (GDP) growth rate, and 8% average inflation rate through targeting a nominal growth rate of 24% in money supply, and maintaining a stable and flexible exchange rate. The Central Bank of Sudan has effectively managed the liquidity in the economy by using indirect monetary policy instruments in a manner, which led to the availability of adequate liquidity to meet the requirements of the economic activities, as well as containing the inflation pressures and maintaining economic stability.

1) Haidar Babker Al Rayah, previous reference, P. 210.
2) Central Bank of Sudan,47[th] Annual Reports, 2007, P. 23

Table (4/4): Some Macro-economic Variables during (2007 – 2010)

Items \ Year	2007	2008	2009	2010
Gross domestic product growth rate	22.21	23.54	27.60	29.00
Inflation rate	8.20	14.30	11.20	13.00
Unemployment rate	16.80	16.00	14.90	13.70
Balance of payments	-129.16	971.15	-1121.00	-247.80

Source: Prepared by the researcher from: Central Bank of the Sudan Annual Reports, different issues.

The year 2011, is the beginning of the second plan of the strategic planning. Also, it witnessed the birth of the Sudan Republic and the secession of South Sudan. The main features of this plan are:

- Decreasing the area of the Republic of the Sudan from million miles and consequently decreasing the number of the neighborhood countries to the Sudan.
- Decrease in population of the Republic of Sudan .
- Decrease in human and natural resources.

Sudan during this period faced by many challenges, which represented in exchange rate pressure, high inflation rate and stagnant economic activities. Therefore, economic policies and measures set to avoid high inflation and absorbed the shock effects in the long run. These policies represented in macro-economic policy that aimed at structural reform in the economy that was accommodated in the Three-Years Economic Reform Program, which aimed at economic stability by decreasing inflation rate, stable exchange rate and substitution of imports to cover the gap of the main strategic goods. Monetary

policy which focused on the decrease of the inflation rate through tightening monetary policy to absorb any excess liquidity in the economy. This was done by coordination with the fiscal policy which aimed at decreasing the general expenditure and decreased the deficit in the general budget. Also, the policies focusing on resources to be directed to the productive sectors and fight the poverty by saving work opportunities for skilled and unskilled labor.

The secession of South Sudan had many negative effects on the Sudanese economy, especially the loss of great amount of the oil returns in general budget of the government. This situation needed strong policy measurements that directed towards the productive sectors like industrial, agricultural and mining sectors. Also, structural adjustment programs of the government, rationalization of general expenditure, and executive monetary policy which aimed at reducing inflation rate and stabilization of exchange rate which ultimately lead to economic stabilization.

The effect of the loss of oil returns reflected directly on balance of payments. The shock of external sector had a great effect on the government sector and macro-economic variables which was represented in exchange rate, inflation rate and decrease on real production. The secession also influenced monetary and banking sector. The main source of money growth is the growth of domestic credit during 1970. The finance of oil sector was the main factor of money expansion during 2000 – 2010. This was due to the stability in exchange rate and improvement of the performance of the economy. Money expansion had been related to the expansion of petroleum exports. Due to the effects of secession, the Sudanese government implemented some additional austerity and rationalization measures which included:

Figure (4/1): Effect of Secession shock on the Sudanese Economy

(1) Loss of large amount of oil returns	**(2)** • Increase in external sector deficit (deficit in balance of payments) • Erosion of foreign currency reserves	**(6)** Decrease the exchange rate	**(7)** • Increase in inflationary stress • Decrease the economic growth rate • External capital migration • Increase in living costs • Instability of the economy • Politic and social violence
(3) • Decrease of general returns of government	**(4)** • Increase of finance by deficit by: a. Borrowing from banking system b. Issuing of fiscal certificates (GMCs and CMCs) c. Borrowing from the external resources.	**(5)** Monetary expansion	

Source: Al-Mesrafi Magazine – Central Bank of Sudan, Khartoum – issue No 62, 2011.

- Partial removal of the fuel subsides.
- The reform package included the expansion of the social subsidy umbrella to encompass additional 500,000 households so as to alleviate poverty and the negative impacts associated with the reforms on vulnerable social segments.
- Raising tax on some commodities.
- Continuing to rationalize spending.

In spite of the loss of oil returns, gold exports substitute this returns and cover large part of the deficit in the external sector. Also, improvement of the traditional exports (agricultural and industrial exports) contributed to increase external returns.

CHAPTER FIVE

ANALYSIS OF THE IMPACT OF MONETARY POLICY ON MACROECONOMIC VARIABLES UNDERSTUDY

CHAPTER FIVE

ANALYSIS OF THE IMPACT OF MONETARY POLICY ON MACROECONOMIC VARIABLES UNDERSTUDY

This part contained the analysis of the data and the methods used to analyzed this data. Secondary data of the study was collected from many sources, from the Central Bank of Sudan reports ,Federal Ministry of Finance, Central Bureau for Statistics, and other sources. This chapter consists of:

- Methodology of the study.
- Analysis of the data collected and test of hypotheses.

(5/1) Methodology of the study:

The study adopted two research methodologies which were:

- The Descriptive Analytical Methodology .
- The Statistical Package of Social Sciences(SPSS).

(5/1/1) The Descriptive Analytical Methodology:

The descriptive analytical methodology describes how macro-economic variables in question increase or decrease and the relation between them and monetary policy mainly money supply using tables and figures to illustrate these relations.

Table (5/1): Money Supply in Sudan (1997 – 2015), (SDG million)

Year	Money supply	Percentage
1997	1805.6	
1998	2069.5	15%
1999	2579.2	25%
2000	3466.7	34%
2001	4322.1	25%
2002	5632.67	30%
2003	7340.9	30%
2004	9604.4	31%
2005	14031.4	46%
2006	17871.8	27%
2007	19714.6	10%
2008	22933.2	16%
2009	28314.5	23%
2010	35497.9	25%
2011	41853.0	18%
2012	58663.3	40%
2013	66445.7	13%
2014	77739.0	17%
2015	93642.6	20%

Source: Prepared by researcher from Central Bank of the Sudan, annual reports, different issues.

Figure (5/1): % Change in Money Supply in Sudan (1997 – 2015)
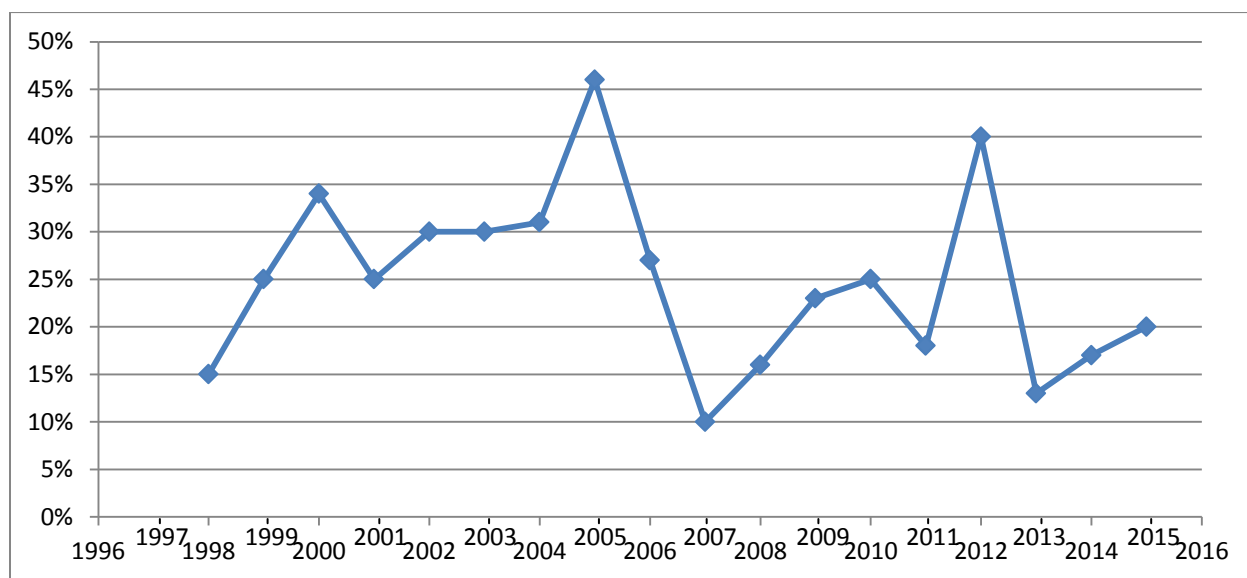
Source: Done by the researcher using Microsoft Excel 2007.

Table and Figure (5/1), show money supply during the period 1997-2015. Money supply increased from SDG 1805.6 million in 1997 to SDG 2069.5million in 1998, and the percentage of the increase was 15%. Money supply increased to reach SDG 2579.2 million in 1999 with percentage increase of 25%. In 2000, money supply increased with 34%. Money supply increased from SDG 4322.1 million in 2001 to SDG 5632.67milloin in 2002 and the percentage of increase reached 30%. In 2003, money supply increased to SDG 7340.9 million compared to the previous year and the percentage of increases reached 30%. Money supply increased to SDG 9604.4million in 2004 and the percentage of increase was 31%. Money supply increased from SDG 14031.4 million in 2005 to SDG 17871.8 million in 2006 with percentage increase of 46%. Money supply increased to reach SDG 19714.4 million with percentage increase of 10%. Money supply increased to SDG 22933.2million in 2008 with percentage of 16%. In the year 2009, money supply increased to SDG 28364.5 million and the percentage of is increase of 23%. In the year 2010, money supply increased by 25% compared to the previous year. Money supply showed an increase of SDG 41853.0 million and the percentage of increase of 18%. In the year 2012, money supply increased to SDG 58663.3 million and the percentage of increase reached 40%. Money supply in the year 2013, increased to reach SDG 66445.7 million with a percentage of 13%. Money supply increased by 17% in 2014. Money supply increased to SDG 93462.6 million in the year 2015 and the percentage of that increase is 20%.

Increase of money supply resulted from the rise in all current payment instruments and quasi money .This was attributed to the increase in currency with public and demand deposits. Expansion in money supply was due to the Ministry of Finance issued more securities and the Central Bank liquidated more securities to solve bank's liquidity problem.

Table (5/2): Inflation Rate in Sudan during (1997 - 2015)

Year	Inflation Rate	Percentage
1997	46.5	
1998	17.51	-62%
1999	16.16	-8%
2000	8.02	-50%
2001	4.9	-39%
2002	8.3	69%
2003	7.7	-7%
2004	8.5	10%
2005	8.5	0%
2006	7.2	-15%
2007	8.2	14%
2008	14.3	74%
2009	11.2	-22%
2010	13	16%
2011	18	38%
2012	35.1	95%
2013	41.9	19%
2014	25.4	-39%
2015	12.6	-50%

Source: Prepared by researcher from Central Bank of the Sudan, annual reports, different issues.

Figure (5/2): %Change in Inflation Rate in Sudan during (1997 - 2015)

Source: Done by the researcher using Microsoft Excel 2007.

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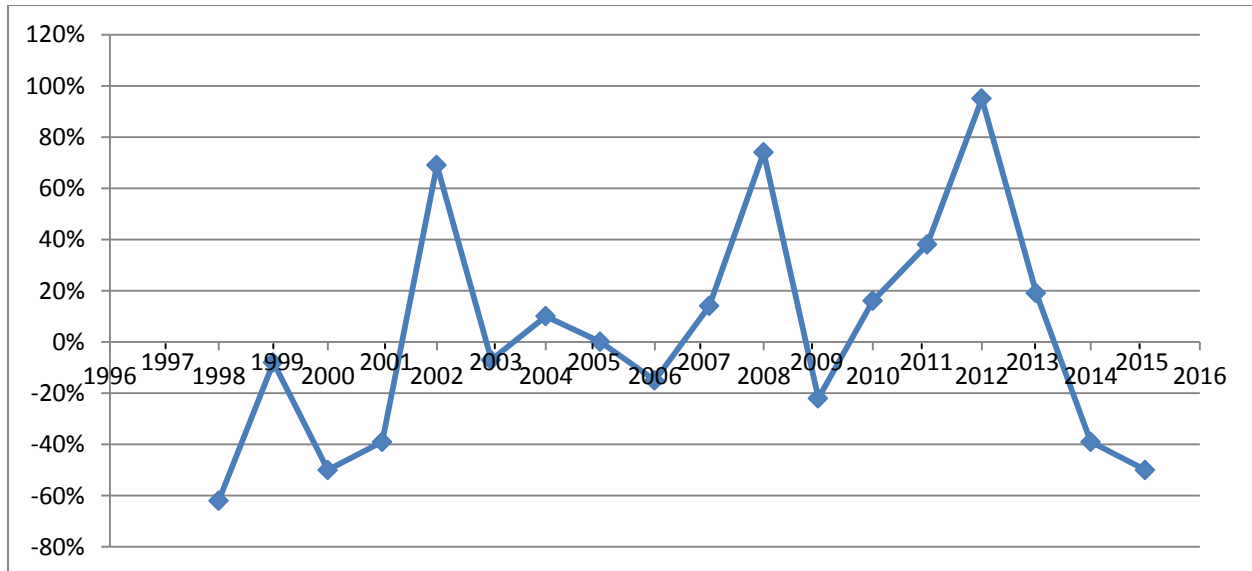
From table (5/2), which illustrated the decrease and increase in inflation rate in Sudan during the period 1997 – 2015. In 1997, inflation rate was 46.5. Inflation rate decreased to 17.51 in the year 1998 with decreasing percentage of 62%. In the year 1999, inflation rate decreased to reach 16.16 and the percentage of decrease was 8%. Inflation rate decreased during the period 2000-2001 from 8.02 to 4.9 and the percentage of decrease was 39%.Inflation rate tended to increase in year 2002 to reach 8.3 with percentage of increase 69%.In the year 2003, inflation rate decreased by percentage of 7% compared to the previous year. Inflation rate remained constant in years 2004 and 2005 .After that ,in year 2006, inflation rate decreased to 7.2 with percentage of 15%. In years 2007 and 2008 ,inflation rate increased to 8.2 and 14.3 respectively. In the year 2009, inflation rate decreased to 11.2 and the percentage of increase was 22%.From the year 2010 to the year 2013, inflation rate increased from 13 to 41.9 ,with percentage of increase reached 16% to 19%. Inflation rate decreased from 25.4 in the year 2014 to 12.6 in year 2015 with percentage of decrease 50%.

Increase in inflation rate was due to that the aggregate expenditure on goods and services exceeded the aggregate output that produced at full-employment. Also, financing the deficit of general budget by borrowing from the banking system and monetizing foreign assets. The decrease in inflation rate due to the contraction of money supply and direct measures of fiscal policy.

Table (5/3): (GDP) in Sudan (1997 - 2015), (SDG millions)

Year	(GDP)	Percentage
1997	11.07	
1998	11.73	6%
1999	12.43	6%
2000	13.46	8%
2001	14.32	6%
2002	15.25	6%
2003	16.17	6%
2004	18.01	11%
2005	19.05	6%
2006	22.22	17%
2007	22.21	0%
2008	23.54	6%
2009	27.6	17%
2010	29.4	6%
2011	27.0	-8%
2012	27.1	0%
2013	28.1	4%
2014	29.0	3%
2015	30.5	5%

Source: Prepared by researcher from Central Bank of the Sudan, annual reports, different issues.

Figure (5/3):%Change in (GPD) in Sudan (1997 - 2015)
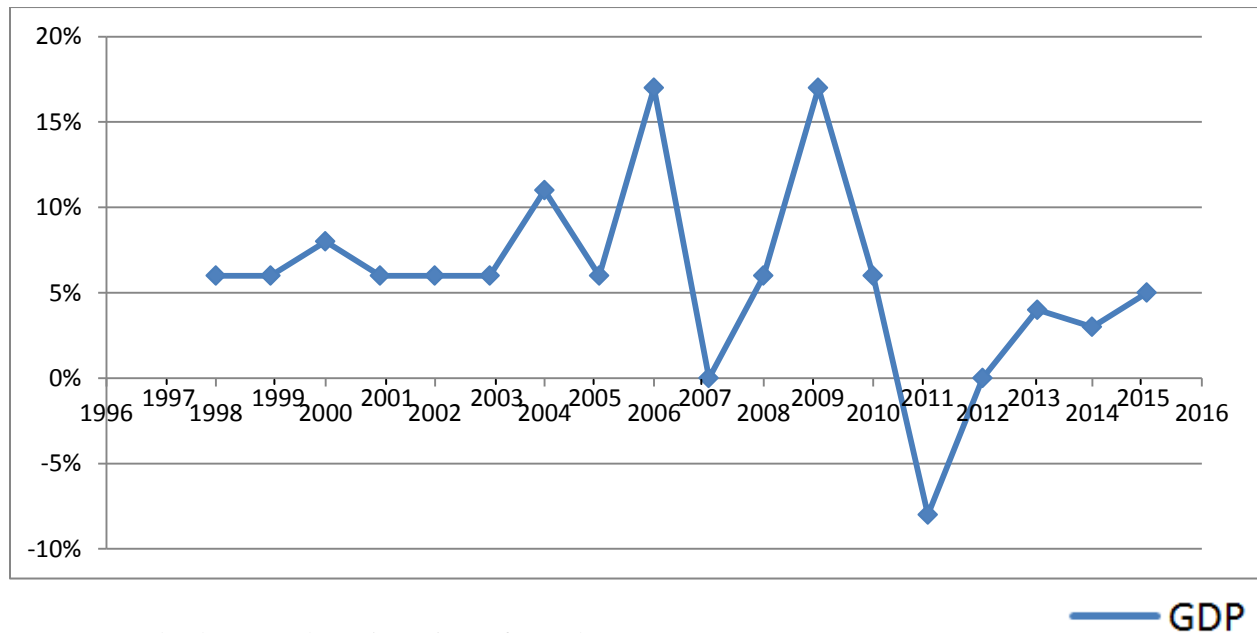
Source: Done by the researcher using Microsoft Excel 2007.

Table and figure (5/3) illustrate the gross domestic product (GDP) in Sudan during the period (1997 – 2015).(GDP) increased during the period 1997 to 2010 and the percentage of increased vary in this period between 6% in the year 1998 , 17% in the year 2009 and 6% in the year 2010. After this period , (GDP) decreased by percentage of 8% in the year 2011. (GDP) remained constant in the year 2011 and 2012, with growth rate about 17% (GDP) increased again in the year 2013 with percentage of 4% .Also (GDP) increased in the year   2014 and the percentage of increase was 3% .In the year 2015, (GDP) increased with percentage of 5%.

Increase in (GDP) was due to the rise of growth rate of industrial sector. This attributed mainly to the rise in growth rate of the oil sub –sector due to the production of newly discovered oil field and other productive sectors. This accompanied by growth and development in the service sector particularly, communications and roads .The decrease of (GDP) was due to drop in productive sectors.

Table (5/4): Balance of Payments in Sudan (1997 - 2015), ($ millions)

Year	Balance of Payments	Percentage
1997	-24	
1998	16	167%
1999	110	588%
2000	-108	-198%
2001	127.6	218%
2002	-300.03	-335%
2003	-422.56	-41%
2004	-730.18	-73%
2005	530.53	173%
2006	526.33	-1%
2007	-1296.16	-346%
2008	971.15	175%
2009	-1121.0	-215%
2010	-247.8	78%
2011	-517.3	-109%
2012	-52.7	90%
2013	-17.6	67%
2014	-3.3	81%
2015	38.4	1264%

Source: Prepared by researcher from Central Bank of the Sudan, annual reports, different issues

Figure (5/4):%Change in Balance of Payments in Sudan (1997 - 2015)
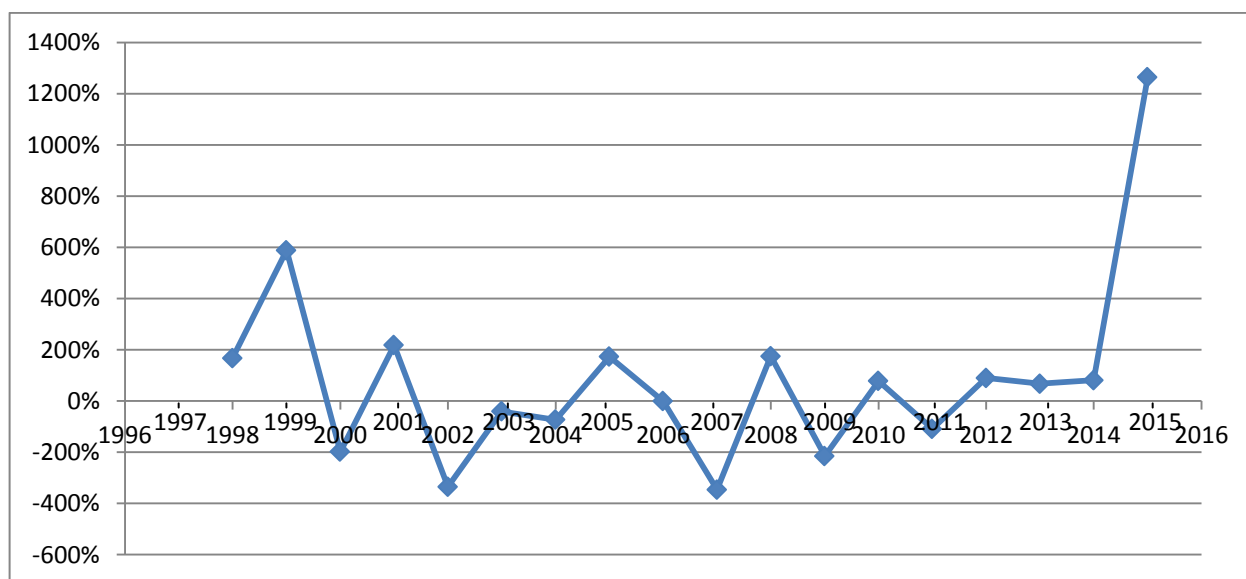
Source: Done by the researcher using Microsoft Excel 2007.

Table and figure (5/4), illustrate the balance of payments in Sudan during the period 1997 – 2015. In the year 1998, balance of payments increased to $16 million and the percentage of increase was 167% , which shows surplus . In the year 1999, balance of payments increased to $110 million and was shown surplus with percentage of 588%. But in year 2000, balance of payments decreased to $108 million and   showed deficit with percentage of 198% .Balance of payments increased in the year 2001 to $127.6 million and the percentage of increase was 218%. From the year 2002 to the year 2004 , balance of payments showed deficit. In the year 2005, balance of payments increased to $530.53 million with percentage of 173% .In the year 2006, balance of payments decreased to $526.33 million with percentage of decrease1%. In the year 2007, balance of payments decreased to $1296.16 million with percentage of 346% .Balance of payments increased in the year 2008 to $971.15 million and the surplus with percentage of 175%.From the year 2009 to the year 2014 ,balance of payments showed deficit from 215% to 81% . Balance of payments increased from $3.3million in the year2014, to $38.4 million with percentage of 1264% compared to the previous year.(To calculate the percentage of balance of payments for any year, the value divided by absolute value of the previous year.)

Deficit was attributed to the swing of trade balance and also to the drop in the services income and transfer account .Therefore, deficit declined when there was an improvement in current account and trade balance.

Table (5/5): Unemployment Rate in Sudan (1997 - 2015)

Year	Unemployment Rate	Percentage
1997	13.5	
1998	13	-4%
1999	12.5	-4%
2000	15.2	22%
2001	15	-1%
2002	15.9	6%
2003	15.8	-1%
2004	16.2	3%
2005	17	5%
2006	17.5	3%
2007	16.8	-4%
2008	16	-5%
2009	14.9	-7%
2010	13.7	-8%
2011	12.0	-12%
2012	14.8	23%
2013	15.2	3%
2014	19.8	30%
2015	21.6	9%

Source: Prepared by researcher from Organization of Economic Cooperation and Development, different issues.

Figure (5/5):%Change in Unemployment Rate in Sudan (1997 - 2015)
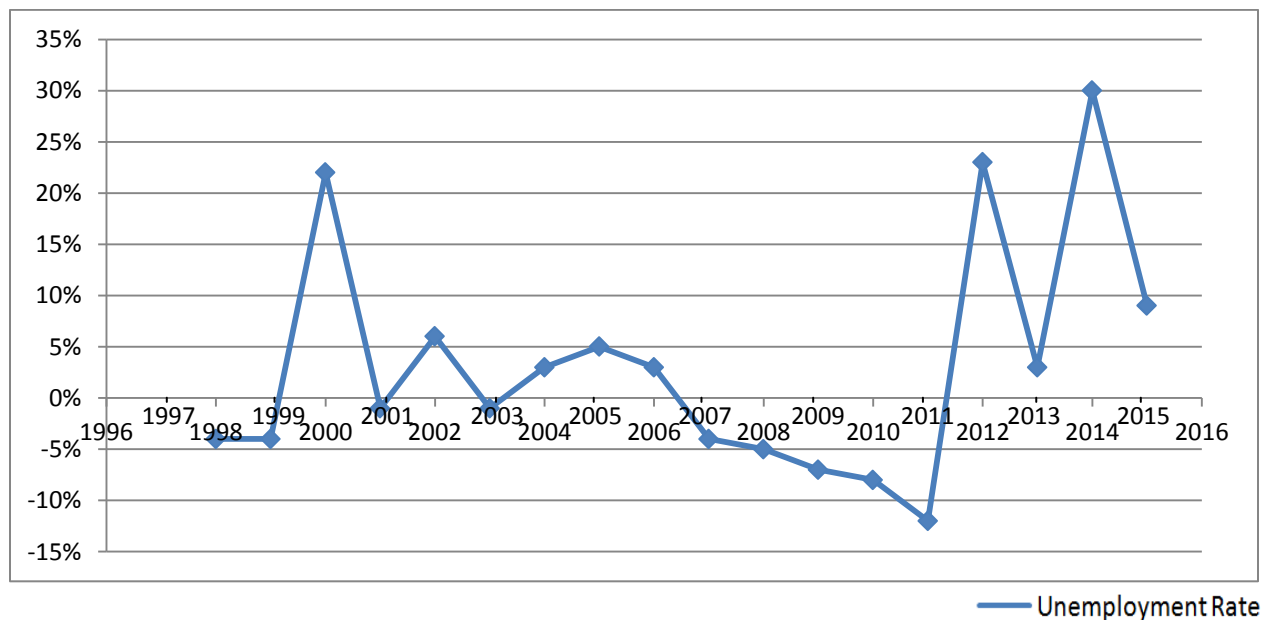
Source: Done by the researcher using Microsoft Excel 2007.

Table and figure (5/5), illustrate the unemployment rate in Sudan during the period 1997 – 2015. Unemployment rate decreased from 13.5 In the year 1997 to 13.0 in the year 1998 with percentage of 4%. Also, it decreased to 12.5 in the year 1999 with percentage of 4%. Unemployment rate increased to 15.2 in the year 2000 with percentage of 20%. Unemployment rate decreased to 15 with percentage of 1% in the year 2001. Unemployment rate in the year 2002, increased to 15.9 with the percentage of increase of 6%. In the year 2003, unemployment rate decreased to 15.8. Unemployment rate continued to increase in the years 2004, 2005 and 2006, to 16.2, 17 and 17.5 respectively. After that, unemployment rate continued to decrease during the period from 2007 to 2011, in different values and percentage from16.8 to 12.0 with percentage of 12% . In the year 2012, unemployment rate increased again to reach 14.8 with percentage of 23% compared to the previous years. In the year 2013, also, the rate of unemployment increased to 15.2 at percentage of 3%. The rate of unemployment increased in 2014 and 2015, to 19.8 and 21.6 and the percentage of increase was 30% and 9% respectively.

Unemployment increase due to slow and low economic growth .Also unemployment increased when inflation rise and change in demand for product.

Table (5/6):% Change in Money Supply and Inflation Rate in Sudan (1997 - 2015)

Year	Money supply	Inflation
1997		
1998	15%	-62%
1999	25%	-8%
2000	34%	-50%
2001	25%	-39%
2002	30%	69%
2003	30%	-7%
2004	31%	10%
2005	46%	0%
2006	27%	-15%
2007	10%	14%
2008	16%	74%
2009	23%	-22%
2010	25%	16%
2011	18%	38%
2012	40%	95%
2013	13%	19%
2014	17%	-39%
2015	20%	-50%

Source: Prepared by researcher from Central Bank of the Sudan, annual reports, different issues.

Figure(5/6): %Change in Money Supply and Inflation Rate in Sudan (1997 - 2015)
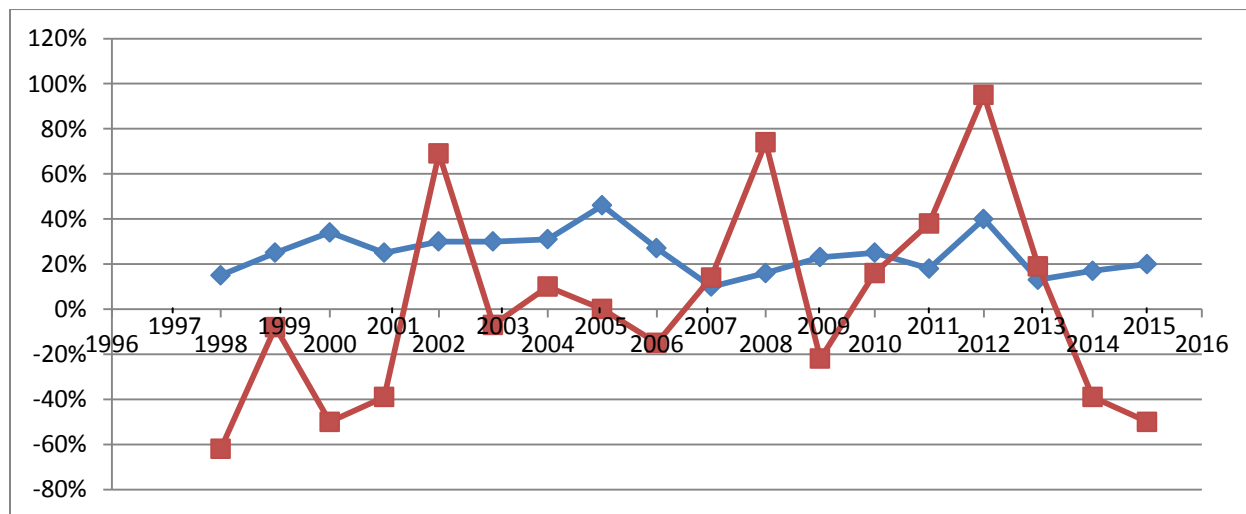
Source: Done by the researcher using Microsoft Excel 2007.

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The above table shows the relation between money supply and inflation rate. Money supply percentage was 15% in 1998 and the inflation percentage is 62%. The percentage of money supply increased to 25% in the year 1999 and the percent of inflation decreased to reach 8%. The year 2000 showed decrease to 50% in inflation and 34% increase in money supply. Money supply decreased to 25% in the year 2001 and the inflation percentage decreased to 39%. Money supply increased in 2002 to reach 30%, also, the inflation percentage increased to 69% which increased too much compared to the previous year. In the year 2003, money supply remained constant at the percentage of 30%, but the inflation decreased too much to reach 7%. There was a little increase in money supply in the year 2004 to 31%, also the inflation rate increased to reach 10%. In the year 2005, money supply increased to reach 46%, whereas, the inflation reached zero percent. Money supply decreased sharply in the year 2006 to 27% and the inflation decreased to 15%. During the year 2007, money supply continued to decrease to reach 10% and the inflation increased to 14 %. Money supply decreased to 16 % and the inflation rate increased rapidly to reach 74% in the year 2008. Money supply increased in the year 2009 to reach 23% and the inflation decreased sharply to reach 22%. In the year 2010, money supply increased to 25%. The inflation rate also, increased to 16% compared to the last year. In the year 2011, money supply decreased to 18%, and the inflation increased to 38%. In the year 2012, money supply increased to reach 40% and the inflation increased to the highest level to reach 95%. Money supply decreased to reach 13% in the year 2013 and the inflation decrease also, to reach 13 % in 2013 , and the inflation decrease also, to reach 19 %. In the year 2014, money supply increase a little pit to 17%, and the inflation rate decreased to 39%. In the year 2015, money supply increased to reach 20% and the inflation rate continued to decrease to reach its lowest value of 50 % as during the year 2000.

Table (5/7):% Change in Money Supply and (GDP) in Sudan (1997 - 2015)

Year	Money supply	GDP
1997		
1998	15%	6%
1999	25%	6%
2000	34%	8%
2001	25%	6%
2002	30%	6%
2003	30%	6%
2004	31%	11%
2005	46%	6%
2006	27%	17%
2007	10%	0%
2008	16%	6%
2009	23%	17%
2010	25%	6%
2011	18%	-8%
2012	40%	0%
2013	13%	4%
2014	17%	3%
2015	20%	5%

Source: Prepared by researcher from Central Bank of the Sudan, annual reports ,different issues.

Figure (5/7):%Change in Money Supply and (GDP) in Sudan (1997 - 2015)

Source: Done by the researcher using Microsoft Excel 2007.

179
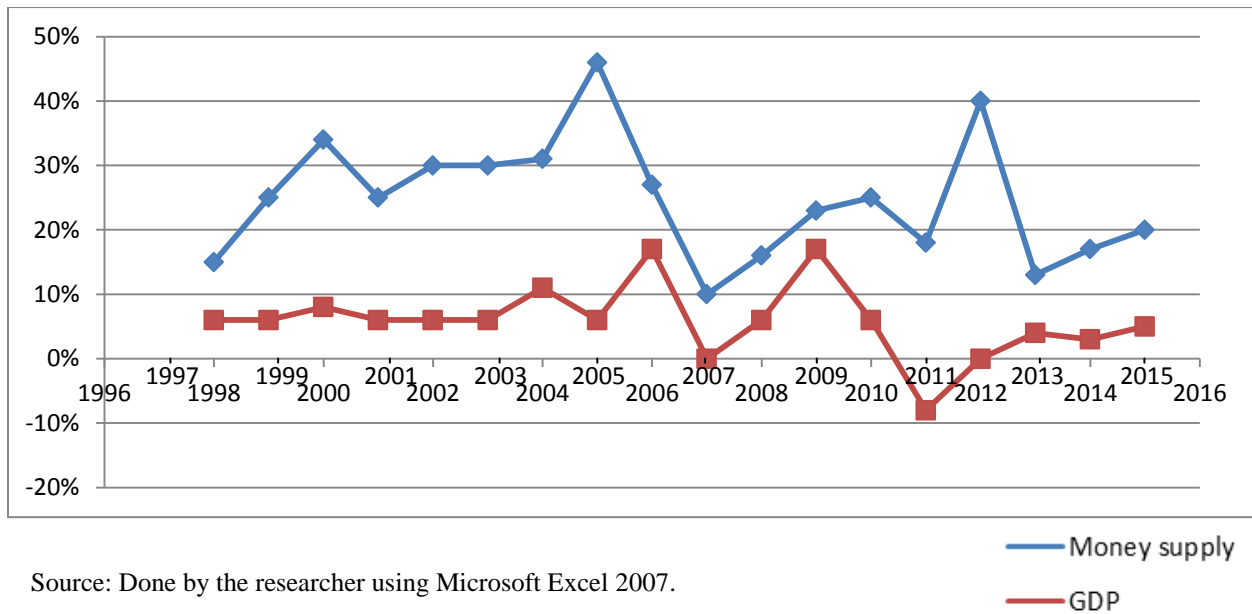
Table and figure (5/7) showed the relation between the money supply and gross domestic product (GDP), during the period 1997 – 2015.

In the year 1998, money supply was 15 % and (GDP) was 6 %. In the year 1999, money supply increased to 25% and (GDP) remained constant. Money supply increased to reach 34% in the year 2000 and (GDP) increased to 8 %. In the year 2001, money supply decreased to 25% and (GDP) decreased to 6 %. Money supply increased to 30% in the year 2002, (GDP) remained constant. Money supply in the year 2003, remained constant at 30% and also, (GDP) remained constant at 6 %. In the year 2004, money supply increased to 31% and also, (GDP) increased to 11 %. In the year 2005, money supply increased to 46%, and (GDP) decreased to 6 %. In the year 2006, money supply decreased to 27 % and (GDP) increased to 17% . Money supply decreased to 10 % and (GDP) decreased to reach zero. In the year 2008 , money supply increased to 16% and (GDP) increased to 6 %. Money supply increased to reach 23 % in the year 2009, and (GDP) increased to 17 %. In the year 2010, money supply increased to 25 %and (GDP) increased to 6 %. Money supply in the year 2011, increased to 18 % and (GDP) decreased to reach the lowest value during the period 1997 – 2015, which was 8%. In the year 2012, money supply increased to 40 % and (GDP) increased to reach zero ,compared to the last year 2011. Money supply in the year 2013, decreased to 13% and (GDP) increased to 4 %. In the year 2014, money supply increased to 17 % and (GDP) decrease to 3 %. Money supply increased to 20% in the year 2015 and (GDP) increased to reach 5%.

Table (5/8):%Change in Money Supply and Balance of Payments in Sudan (1997 - 2015)

Year	Money supply%	Balance of Payments %
1997		
1998	15%	167%
1999	25%	588%
2000	34%	-198%
2001	25%	218%
2002	30%	-335%
2003	30%	-41%
2004	31%	-73%
2005	46%	173%
2006	27%	-1%
2007	10%	-346%
2008	16%	175%
2009	23%	-215%
2010	25%	78%
2011	18%	-109%
2012	40%	90%
2013	13%	67%
2014	17%	81%
2015	20%	1264%

Source: Prepared by researcher from Central Bank of the Sudan, annual reports, different issues.

Figure (5/8):%Change in Money Supply and Balance of Payments in Sudan (1997 - 2015)

Source: Done by the researcher using Microsoft Excel 2007.

181
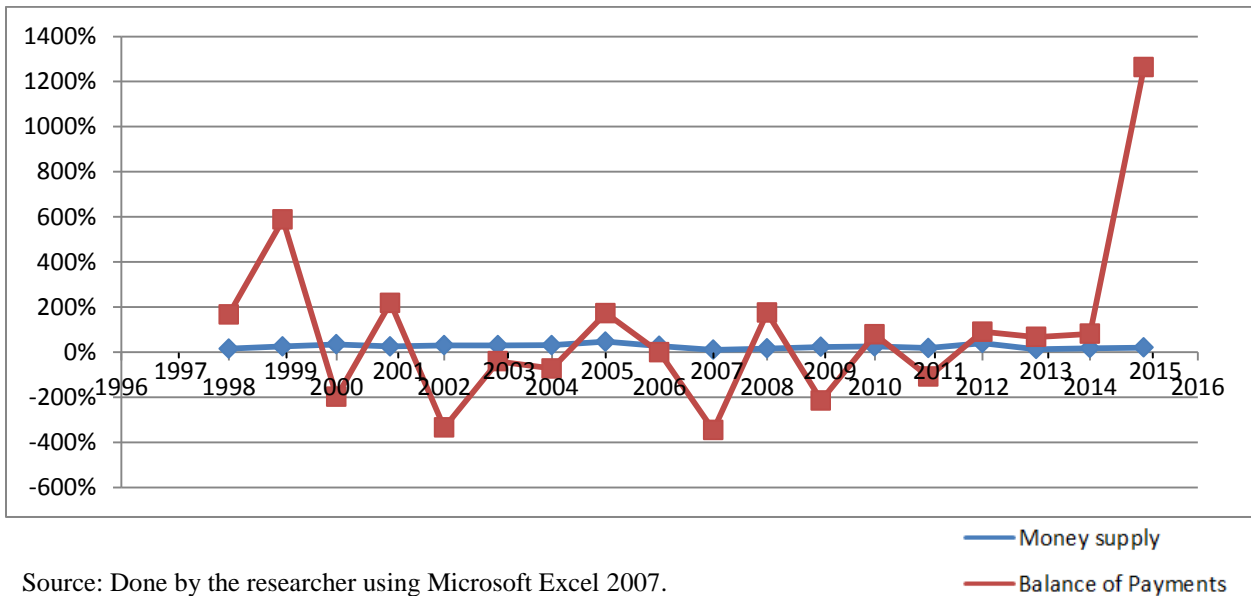
Table and figure (5/8) show the relation between money supply and balance of payments, in Sudan during the period 1997 – 2015.

In the year 1998, money supply was 15% and the balance of payments was 167%. In the year 1999, money supply increased to 25% and balance of payments increased to 588%. Money supply increased to reach 34% in the year 2000, and balance of payments decreased to 198%. In the year 2001, money supply decreased to 25% and the balance of payments decreased to 218% compared to the previous year. In the year 2002, money supply increased to 30%, but the balance of payments continued to decrease reaching 335%. Money supply remained constant in the year 2003, and balance of payments increased to 41%. In the year 2004, money supply increased to 31% and balance of payments increased to 73%. Money supply increased to reach 46% and the balance of payments decreased to 173%. In the year 2006, money supply decreased to 27% and balance of payments also, decreased 1%. Money supply decreased to 10% in the year 2007 and balance of payments decreased to 346%. After the year 2007, money supply increased at different values until 2010, and the balance of payments also, decreased at different values during the same period. Money supply decreased to 13% in the year 2013and the balance of payments decreased to 67%. In the year 2014 and 2015, money supply increased to 17% and 20% respectively and balance of payments decreased to different values to reach its lowest values during the same period.

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Table (5/9):% Change in Money Supply and Unemployment Rate in Sudan (1997 - 2015)

Year	Money supply%	Unemployment Rate
1997		
1998	15%	-4%
1999	25%	-4%
2000	34%	22%
2001	25%	-1%
2002	30%	6%
2003	30%	-1%
2004	31%	3%
2005	46%	5%
2006	27%	3%
2007	10%	-4%
2008	16%	-5%
2009	23%	-7%
2010	25%	-8%
2011	18%	-12%
2012	40%	23%
2013	13%	3%
2014	17%	30%
2015	20%	9%

Source: prepared by researcher from Central Bank of the Sudan, annual reports, different issues.

Figure (5/9):%Change in Money Supply and Unemployment rate in Sudan (1997 – 2015)

Source: Done by the researcher using Microsoft Excel 2007.

183
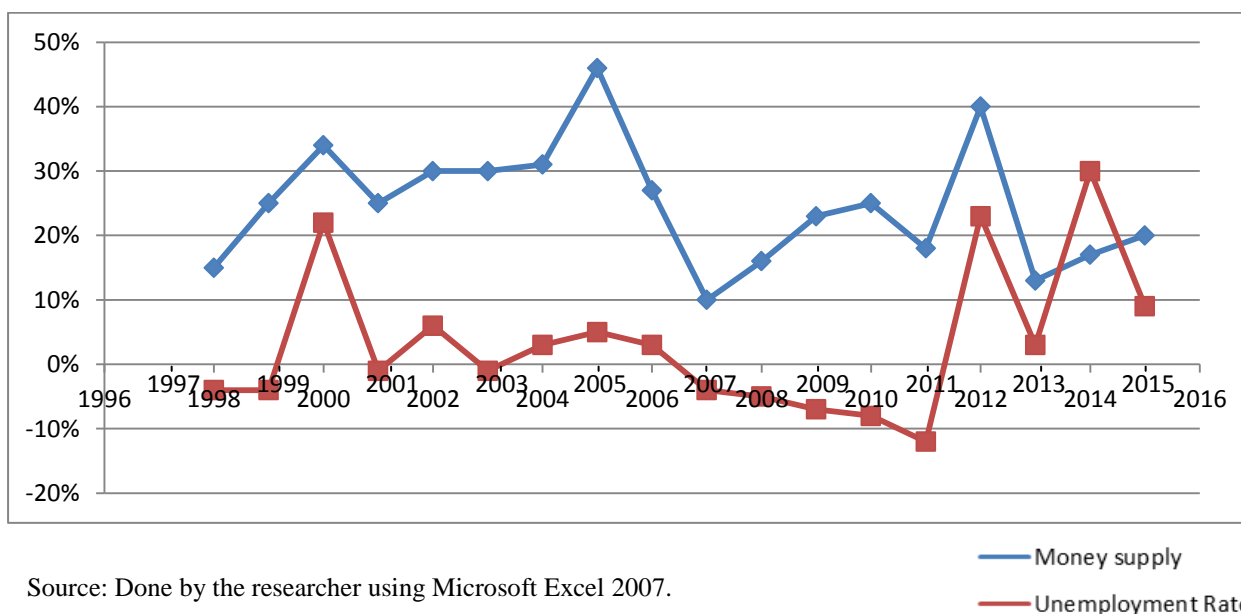
Table and figure (5/9) show the relation between the money supply and unemployment rate in Sudan during the period 1997 – 2015.

In the year 1998, money supply was 15% and unemployment rate was 4%. Money supply increased in the year 1999 to 25% and unemployment rate remained as it is. In the year 2000, money supply increased to 34% and unemployment rate also, increased to 22%. Money supply decreased to return back to 25% in the year 2001 but unemployment decreased to 1%. Money supply remained constant during the year 2002 and 2003, at 30% and unemployment increased in the year 2002 to reach 6% but decreased in the year 2003 to reach 1%. In the year 2004, money supply increased to 31% and unemployment rate increased to 3%. Money supply increased to 46% in the year 2005 and the unemployment rate also, increased to 5%. Money supply decreased to 27% in the year 2006 and unemployment decreased to 3%. In the year 2007, money supply decreased to 10% and unemployment decrease to 4%. Money supply increased during the years 2008, 2009 and 2010 to 16%, 23% and 25% respectively. Unemployment rate decreased during the same period to 5%, 7% and 8% respectively. In the year 2011, money supply decreased to 18% and unemployment decreased to 12%. Money supply increased to 40% in the year 2012 and unemployment rate increased to reach 23%. In the year 2013, money supply decreases to 13% and unemployment rate decrease to 3%. Money supply increased from 17% in the year 2014 to reach 20% in the year 2015 and unemployment rate decreased from 30% in the year 2014 to 9% in the year 2015.

Table (5/ 10):% Change in Money Supply and Macroeconomic Variables

Year	Money supply%	Inflation Rate %	GDP %	Balance of Payments %	Unemployme nt Rate %
1997					
1998	15%	-62%	6%	167%	-4%
1999	25%	-8%	6%	588%	-4%
2000	34%	-50%	8%	-198%	22%
2001	25%	-39%	6%	218%	-1%
2002	30%	69%	6%	-335%	6%
2003	30%	-7%	6%	-41%	-1%
2004	31%	10%	11%	-73%	3%
2005	46%	0%	6%	173%	5%
2006	27%	-15%	17%	-1%	3%
2007	10%	14%	0%	-346%	-4%
2008	16%	74%	6%	175%	-5%
2009	23%	-22%	17%	-215%	-7%
2010	25%	16%	6%	78%	-8%
2011	18%	38%	-8%	-109%	-12%
2012	40%	95%	0%	90%	23%
2013	13%	19%	4%	67%	3%
2014	17%	-39%	3%	81%	30%
2015	20%	-50%	5%	1264%	9%

Figure (5/ 10):% Change in Money Supply and Macroeconomic Variables

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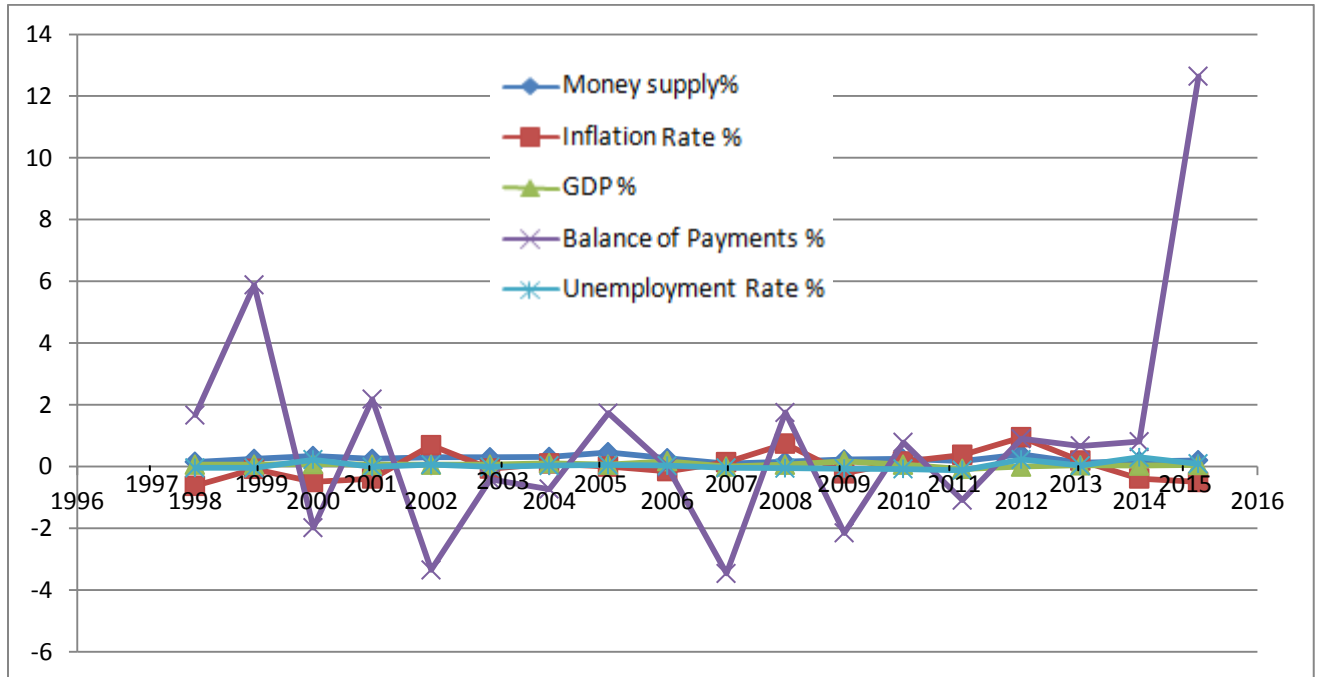
(5/1/2) Statistical Analysis of Study Data:

This analysis used the Statistical Package of Social Sciences (SPSS) to analyze the data of the study and checkup the validity of the hypotheses of the study. The research used the time series data of some economic variables which are money supply as determinant of monetary policy in Sudan, inflation rate, gross domestic product, in addition to the balance of payments and unemployment rate as dependent variables, during the period from the year 1997 to the year 2015.

The data of this study obtained from different sources. The data of money supply, gross domestic product (GDP), and balance of payments from the Central Bank of Sudan's annual reports for sequential years from the 1997 to the year 2015. The inflation rate data collected from the Central Bureau of Statistics, and the rate of unemployment obtained from Organization of Economic Cooperation and Development (OECD).

This study dealt with the impact of monetary policy on macro-economic variables in Sudan during the period from the year 1997 to the year 2015. The study adopted four economic models below which represents the money supply rate (MS) in Sudan as independent variable and Inflation rate (I), the Gross Domestic Product (GDP), Balance of payments (B) and Unemployment rate (E) as dependent variable. The models designed as follows:

1. $I = f(MS)$

$$I = \alpha + B_1 MS \qquad\qquad B_1 > 0$$

2. $GDP = f(MS)$

$$GDP = \alpha + B_2 MS \qquad\qquad B_2 > 0$$

3. $B = f(MS)$

$$B = \alpha - B_3MS \qquad\qquad B_3 < 0$$

4. $E = f\,(MS)$

$$E = \alpha + B_4MS \qquad\qquad B_4 > 0$$

Whereas:

Ms $\quad\equiv$ Money Supply

I $\qquad\equiv$ Inflation Rate

GDP $\equiv$ Gross Domestic Product

B $\qquad\equiv$ Balance of Payments

E $\qquad\equiv$ Unemployment Rate

$\alpha, \beta'_s \quad\equiv$ Model coefficients

The Ordinary Least Square method (OLS) was applied and used the statistical package of social sciences (SPSS) for measuring the previous model, the case of the study and estimating the model coefficient to prove the validity of the model hypotheses, which were:

First: The relationship between money supply (MS) and the inflation rate (I) in the Sudan is proportional relation. That is, when money supply (increase – decrease) this leads to (increase – decrease) of inflation rate in Sudan.

Second: The relationship between money supply (MS) and the gross domestic product (GDP) is a proportional relation. That is, when the money supply increase lead to the increase of (GDP) in Sudan.

Third: The relationship between money supply (MS) and the balance of payments (B) is an inverse relation, that is an increase in money supply lead to a decrease in balance of payments.

Fourth: The relationship between money supply (MS) and Unemployment rate (E) is a proportional relation, that is, when the money supply increase lead to increase in unemployment rate.

After collecting the data of the period 1997 – 2015 for the variables under study, money supply, inflation rate, balance of payments, gross domestic product, and the unemployment rate, data was processed through the statistical analytical program (SPSS) and proceeded the test of regression analysis. The following results were obtained:

(5/2) Test of Regression Analysis:
(5/2/1) Durbin Watson Test:

After proceeding the test of regression analysis to checkup internal correlation problems by using Durbin Watson Test, which resulted in:

$$D.W = 0.806$$

$$Dl = 0.97$$

$$Du = 1.68$$

Whereas:

DL ≡ Lower critical value

Du = Upper critical value

The value of (DL) and (DU) were found out from Durbin Watson table according to the numbers of dependent variables which are 4 and the sample volume which is 19.

Although the Durbin Watson (DW) less than(DL), that means there is no internal correlation problem. After proceeding the analysis of the regression test on

the variables, money supply, inflation rate, gross domestic product, balance of payments, and unemployment rate as dependent variables, the following results were achieved:

Regression Model:

After the test of regression analysis was done, to know the values of coefficient of regression line, the regression models were as follows:

1. $I = 12.296 + 0.0002\ MS$

- When (MS) is constant, (I) is increased by 12.296.
- If (MS) increased by one unit, (I) increased by 0.0002 .

2. $GDP = 15.333 + 0.0002\ MS$

- When (MS) is constant, (GDP) increased by 15.333.
- If (MS) increased by one unit, (I) increased by 0.0002 .

3. $B = -146.375 + 0.0005\ MS$

- When (MS) is constant, (B) increased by -146.375.
- If (MS) increased by one unit, (I) increased by 0.0005 .

4. $E = 14.366 + 0.00005\ MS$

- When (MS) is constant, (E) increased by -146.375.
- If (MS) increased by one unit, (I) increased by 0.00005.

Coefficient of Correlation (R) and Coefficient of Limitation R^2:

After the test of regression analysis was done to know the correlation of the variables inflation rate, gross domestic product, balance of payments, and unemployment rate the following results were obtained:

1. **Money supply and Inflation rate**:

Table (5/ 11): Effect of Money Supply on Inflation Rate

R	R square	Std. Error of Estimate
0.357	0.128	11.7

Source: Prepared by the researcher using SPSS

From Table (5/ **11**), (R) value represented the simple correlation coefficient is 0.357, which indicated a weak degree of correlation between money supply and inflation rate.

(R^2) value indicated how much of total variation inflation rate, can be explained by money supply. In this case, only 12.8% of variation in inflation rate was due to money supply and 87.2% due to random errors.

2. **Money supply and GDP:**

Table (5/ 12): Effect of Money Supply on GDP

R	R square	Std. Error of Estimate
0.862	0.743	3.53942

Source: Prepared by the researcher using SPSS

This table provide (R) and (R^2) values, (R) value represented the simple correlation coefficient, which indicated a strong degree of correlation between money supply and (GDP)

(R^2) value indicated how much the total variation in (GDP) can be explained by money supply. In this case, 74.3% of variations in (GDP) were due to money supply.

3. **Money supply and Balance of Payments:**

$$B = \alpha - B_3 \ MS$$

Table (5/ 13): Effect of Money Supply on Balance of Payments

R	R square	Std. Error of Estimate
0.02636	0.000695	557.115

Source: Prepared by the researcher using (SPSS).

From table (5/11) , (R) value represented the simple correlation coefficient was 0.026, which indicated a very weak degree of correlation between money supply and balance of payment.

(R^2) value indicated how much the total variation in balance of payment can be explained by money supply. In this case, only 0.0695% of variations in balance of payments were due to money supply.

4. **Money supply and Unemployment Rate:**

$$E = \alpha + B_4 \ MS$$

Table (5/ 14): Effect of Money Supply on Balance of Payments

R	R square	Std. Error of Estimate
0.544	0.296	2.03964

Source: Prepared by the researcher using (SPSS).

This table provide (R) and (R^2) values. (R) value represented the simple correlation coefficient is 0.544 which indicated a medium degree of correlation between money supply and unemployment rate.

(R^2) value indicated how much the total variation in unemployment rate, can be explained by money supply. In this case, only 29.6% variations in money supply were due to money supply.

Table (5/ 15): Significance Test of Regression Coefficient

Model	Regression Coefficient	t	Sig.
I	12.296	3.260	0.005
GDP	15.333	13.441	0.000
B	- 146.375	-0.81522	0.426
E	14.366	21.853	0.000

Source: Prepared by the researcher using(SPSS).

(5/2/2) Test of The Significance for Coefficient of Regression:

Test of Inflation Rate:

H_0:   The coefficient of inflation rate $= 0$ (not significant)

H_1:   The coefficient of inflation rate $\neq 0$ (significant)

From the table of t-distribution, the tabulated t-value by degree of freedom 18 and value of significant level 0.05, equal to 2.101. The calculated t-value from table (5/15) is equal to 3.260

Although the calculated t. value is greater than the tabulated t. value. Therefore, H_0 is rejected and H_1 is accepted, which indicated, that the coefficient of inflation rate was not equal to zero (significant).

Test of Gross Domestic Product:

H_0:   The coefficient of GDP $= 0$ (not significant)

H_1:   The coefficient of GDP $\neq 0$ (significance)

From the table of t-distribution. The tabulated t-value by degree of freedom 18 and the value of significant level of 0.05 is equal to 2.101 and the calculated t-value from table (5/15) was equal to 13.441. The calculated t-value is greater than

the tabulated t-value, so that H_0 is rejected and H_1 is accepted. This indicates that the coefficient of gross domestic product does not equal to zero (significant).

Test of Balance of Payments:

H_0:   The coefficient of balance of payments $= 0$ (not significant)

H_1:   The coefficient of balance of payments $\neq 0$ (significance)

From the table of t-distribution. The tabulated t-value by degree of freedom 18 and value of significant level of 0.05 is equal to 2.101 and the calculated t-value from table (5/15) equal to 0.81522. The calculated t-value is less than the tabulated t-value, so that H_0 is accepted and H_1 is rejected. This indicated that the coefficient of balance of payments equal to zero (not significant).

Test of Unemployment rate:

H_0:   The coefficient of unemployment rate $= 0$ (not significant)

H_1:   The coefficient of unemployment rate $\neq 0$ (significance)

From the table of t-distribution. The tabulated t-value by degree of freedom 18 and value of significance level of 0.05 is equal to 2.101 and the calculated t-value from table (5/15) equal to 21.853. The calculated t-value is greater than the tabulated t-value, so that H_0 is rejected and H_1 is accepted. This indicated that the coefficient of unemployment rate is not equal to zero (significant).

(5/3) Test of Hypotheses:

The coefficient test for the two correlated samples was used to verify the validity of each hypothesis of the study, as follows:

First Hypothesis:

There is a significant statistical relationship between money supply and inflation rate.

H_0:   There is not statistical relationship between money supply and inflation rate.

H_1:   There is a statistical relationship between money supply and inflation rate.

After t. test was done, the results obtained were written in the following table:

Table (5/16): Model Coefficients Test – Inflation Rate

Model	Un standardized Coefficients Test		t	Sig.
	B	Std. Error		
(Constant)	12.296	3.772	3.260	0.005
Money Supply	0.0002	0.000	1.577	0.133

Source: Prepared by the researcher using (SPSS).

Figure (5/ 11): Linear Relationship between Money Supply (SDG) and Inflation Rate
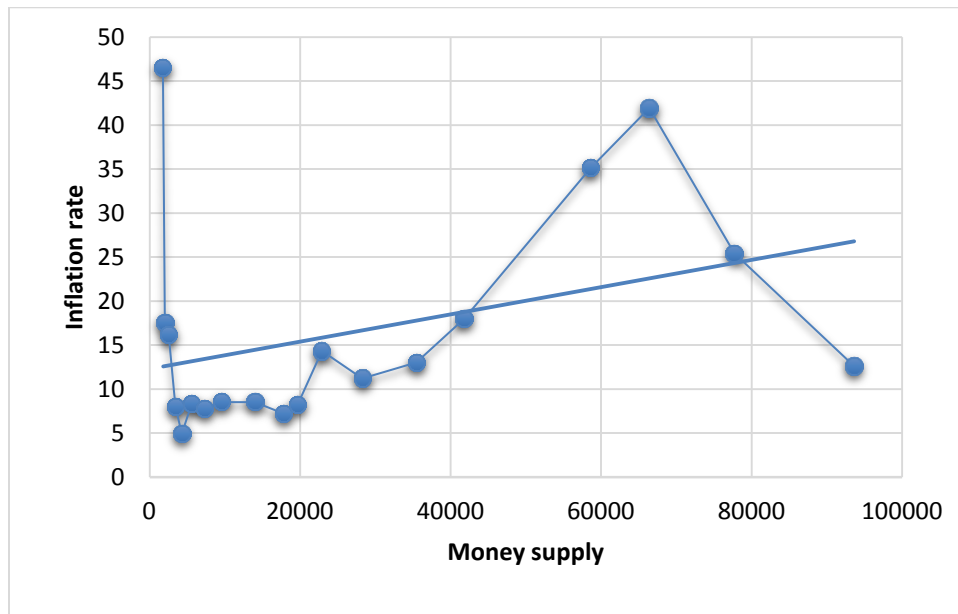
Source: Prepared by the researcher using (Excel).

The coefficient table (5/16) and figure (5/11), provide the necessary information to predict inflation from money supply and determined where money supply contributed significantly to inflation rate. Based on the significance of the model where "sig" is equal to 0.133 is greater that the value of significant level 0.05. H_0 was accepted and H_1 was rejected. This indicated statistical insignificant correlation between money supply and inflation rate. Furthermore, when used value in "B" column, the inflation rate was: $12.296 \pm 3.772\%$

Second Hypothesis:

There is a significant statistical relationship between the money supply and gross domestic product (GDP).

H_0:   There is no statistical relationship between money supply and gross domestic product.

H_1:   There is a statistical relationship between money supply and gross domestic product.

Table (5/17): Model Coefficients Test – (GDP)

Model	Un standardized Coefficients Test		t	Sig.
	B	Std. Error		
(Constant)	15.333	1.141	13.441	0.000
Money Supply	0.0002	0.000	7.018	0.000

Source: Prepared by the researcher using (SPSS).

Figure (5/ 12): Linear Relationship between Money Supply and (GDP)
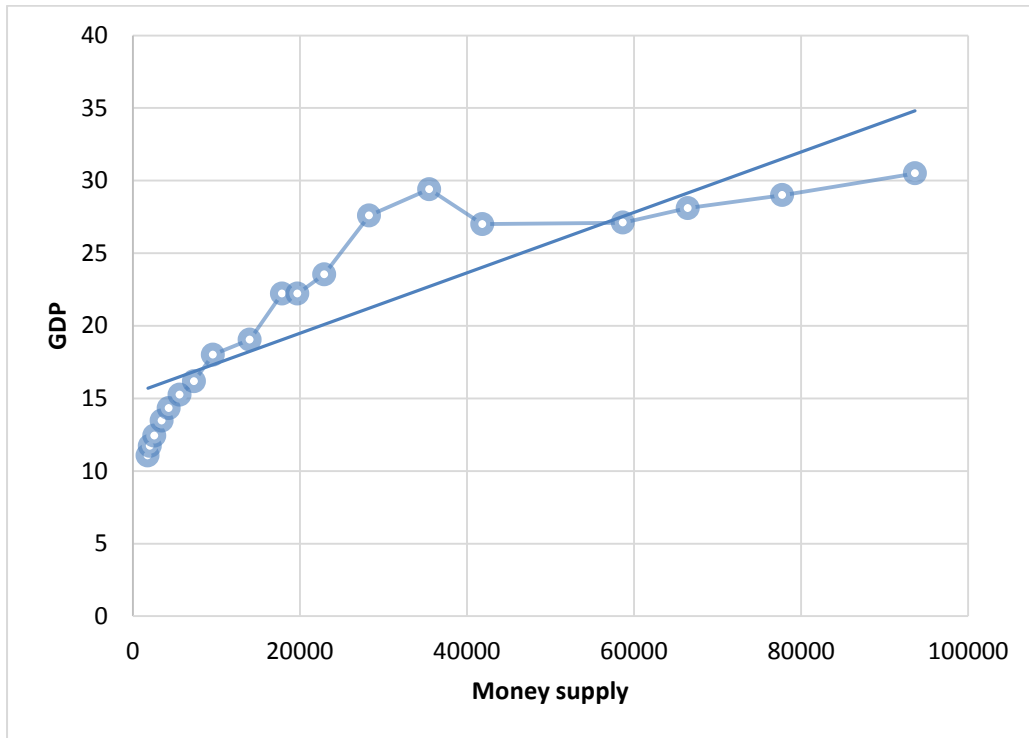
The coefficient table (5/16) and figure (5/12), provided the necessary information to predict (GDP) from money supply and determined whether money supply contributed significantly to (GDP). Based on the significance of the model, where "sig" is equal to 0.000 and less than the value of significant level 0.05. H_0 was rejected and H_1 was accepted. This indicated statistically significant correlation between money supply and (GDP) and hence, (GDP) is significantly depend on money supply. When used the value in "B" column, (GDP) is 15.33 $\pm$ 1.141%.

$$MS\ \alpha\ GDP$$

Third Hypothesis:

There is a significant relationship between the money supply and balance of payments.

H_0:   There is no statistical relationship between money supply and balance of payments.

H_1:   There is a statistical relationship between money supply and balance of payments.

Table (5/18): Model Coefficients Test – Balance of Payments

Model	Un standardized Coefficients Test		t	Sig.
	B	Std. Error		
(Constant)	-146.375	179.5539	0.81522	0.426
Money Supply	0.000507	0.004666	0.108723	0.915

Source: Prepared by the researcher using (SPSS).

Figure (5/ 13): Linear Relationship between Money Supply and Money Supply
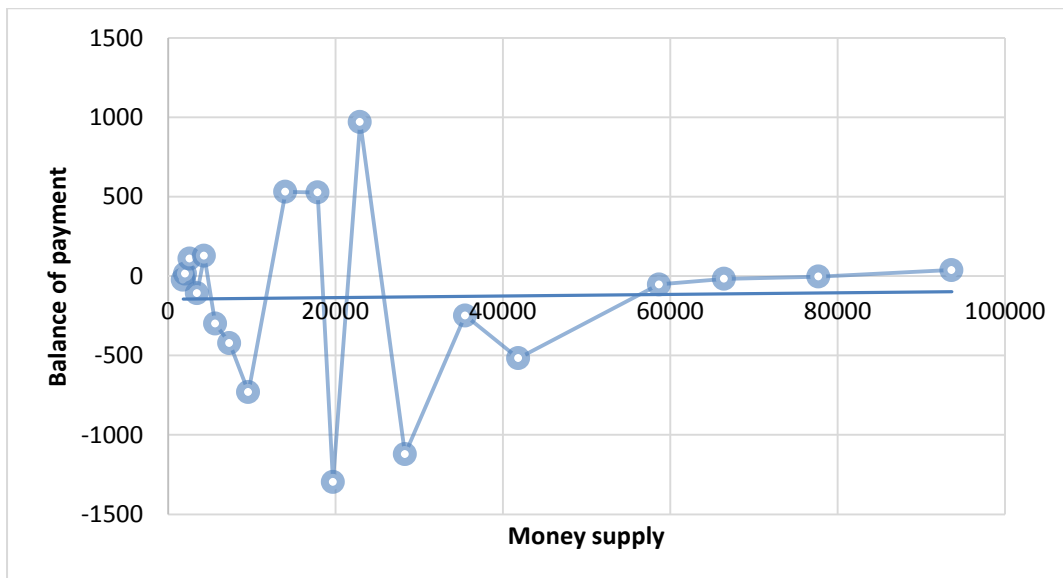
Source: Prepared by the researcher using (Excel).

Table (5/18) and figure (5/13), provided the necessary information to predict balance of payments from money supply and determined whether money supply contributed significantly to balance of payments. Based on the significance of the model, where "sig" is equal to 0.915. this "sig" is greater than the value of significant level, so, H_0 is accepted and H_1 is rejected. This indicated statistically insignificant correlation between money supply and balance of payments. When used the values in "B" column, the balance of payments is: -146.375 ± 179.554%.

Fourth Hypothesis:

There is a significant relationship between money supply and unemployment rate.

H_0:   There is no statistical relationship between money supply and unemploy-
         ment rate.

H_1:   There is a statistical relationship between money supply and unemployment
         rate.

Table (5/19): Model Coefficients Test – Unemployment Rate

Model	Un standardized Coefficients Test		t	Sig.
	B	Std. Error		
(Constant)	14.366	0.657	21.853	0.000
Money Supply	0.0000457	0.000	2.674	0.016

Source: Prepared by the researcher using (SPSS).

Figure (5/ 14): Linear Relationship between Money Supply and Unemployment Rate
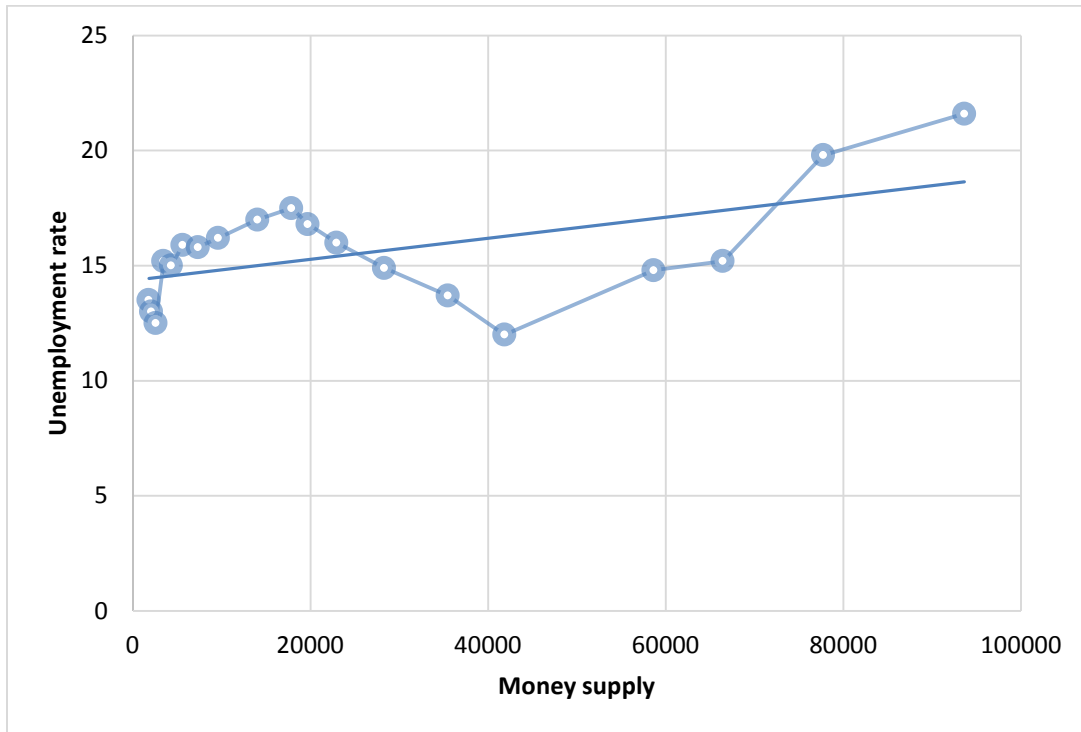
Source: Prepared by the researcher using (Excel).

The coefficient table (5/19) and figure (5/14), provided the necessary information to predict unemployment rate from money supply and determined whether money supply contributed significantly to unemployment rate. Based on the significance of the model slop, where "sig" is equal to 0.016 and less than the value of significant level 0.05. H_0 was rejected and H_1 was accepted. This indicated statistically significant correlation between money supply and unemployment rate. and hence, unemployment rate is significantly depend on money supply. Furthermore, used the value in "B" column, unemployment rate is $14.366 \pm 0.657\%$.

(5/4) Conclusion:

The Sudanese economy need a strong policies and measures to boom in all the productive sectors. This is can be obtained by having balance in the economy, which creates more opportunities of work, price stability and low inflation rate. This can be obtained by applying rational policies in all economic sectors. Sudan has a huge human and natural resources that can be best utilized in the future to achieve stability and development in the economy as a whole which lead to human welfare.

RESULTS AND RECOMMENDATIONS

RESULTS AND RECOMMENDATIONS

(I) Results:

The analysis of macro-economic variables, money supply, inflation rate, gross domestic product, balance of payments, and unemployment rate, shows these results:

- Money supply increased during the period of the study and sometimes increased with decreasing rate.
- The inflation rate increased during the period of the study .
- The gross domestic product increased during the period of the study except in few years.
- The balance of payments represented deficit during the period of the study except in a few years.
- The unemployment rate increased with fluctuating rate during the period of the study.
- The statistical analysis of the data during the period 1997 – 2015 to verify the validity of the hypotheses, indicated that the relationship between the money supply as independent variable and inflation rate and balance of payments was insignificant relation and money supply had no effect on these two variables.
- Also, the analysis indicated that the relationship between money supply and GDP and Unemployment rate was significant relation. Therefore, money supply had great effect on these two variables.
- The fluctuation in gross domestic product is due to the changes in climate and environment. Because the agricultural sector is the main economic sector which contribute by more than 40% of the(GDP).

- The direct effect of an increase in money supply stem from the fact that people desire to spend more on real goods and services when they have excess money balances.

- The indirect effect of increase in money supply works through lowering of interest rate, which encourage businessmen to make new investments with money loaned to them. Also, individual will engage in more consumption of durable goods.

(II) Recommendations:

The study recommended many recommendations, the most important of which were :

- Activation of the role of the Central Bank of Sudan in controlling money supply by using all the instruments of controlling money supply simultaneously .

- Maintenance of national economic growth with maintaining the price stability and achievement of external and internal balance.

- Decrease the deficit of the current account of the balance of payments by encouraging the export sector by production for export.

- Developing infrastructure in communications, storage and transportation, besides the stability of economics, politics, and security to attract the foreign investments.

- The Central Bank of Sudan should take control of managing the liquidity volume assigned for the private sector by using the tools and instruments that serve the objectives of monetary policy.

- Utilization of Islamic monetary tools to mobilized the liquidity.

- Change the economy from traditional framework to the modern framework by benefiting from the modern technology and scientific development.

- Adopting comprehensive information policy and connect it with the education and encourage different academic institutions to apply these techniques to contribute in integrating the Sudanese economy with the international economy.

- Connection of the scientific research with the production sectors in agriculture, industry and services.

- Rationalization of the government expenditure and reduce the borrowing from the banking system.

- Setting policies and measures that aim to reduce the inflation and unemployment rates.

- Utilization of direct measures related to monetary and fiscal tools to reduced inflation rate.

(III) Suggested Researches:

1. Potential Gains from Economic Policies Coordination.
2. Future Economic Trends and Investment Opportunities.

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APPENDICES

APPENDICES

Appendix (I): Money supply in Sudan (1998-2008)

(SDG Million)

PARTICULAR	98/12/31	99/12/31	2000/12/31*	2001/12/31	2002/12/31	2003/12/30	2004/12/30	2005/12/31**	2006/12/31**	2007/12/31	2008/12/31
Money Supply :	2,069.5	2,579.2	3,466.7	4,322.1	5,632.7	7,340.9	9,604.5	14,031.4	17,871.8	19,714.6	22,933.2
Currency With Public	821.4	1,081.1	1,420.8	1,538.4	1,935.8	2,402.1	3,849.0	3,740.4	5,355.3	5,639.7	6,774.6
Demand Deposits	487.2	615.1	925.1	1,175.5	1,586.8	2,182.7	2,994.7	4,447.6	5,168.8	5,734.9	6,862.9
Quasi –Money	766.9	883.1	1,120.8	1,608.3	2,110.0	2,756.1	3,560.8	5,843.4	7,347.7	8,340.0	9,295.7
Net Foreign Assets	(6,699.9)	(7,227.1)	(6,780.2)	(6,996.3)	(6,244.5)	(5,699.1)	(3,498.6)	(580.3)	(1,846.0)	(2,539.9)	(2,320.5)
BOS External Assets	215.5	486.3	731.0	412.5	1,198.0	2,297.2	4,203.6	5,884.3	4,298.1	3,552.3	4,077.6
Fund Accounts	(3,667.3)	(3,987.6)	(3,738.3)	(3,583.7)	(3,843.3)	(4,153.8)	(4,118.5)	(3,473.7)	(3,180.0)	(3,293)	(3,339)
Short Term Loans	(279.4)	(256.8)	(278.5)	(260.8)	(264.8)	(267.3)	(264.7)	(251.5)	(306.2)	(490)	(246)
Payment Agreements	(233.0)	(240.1)	(246.2)	(196.4)	(191.2)	(153.1)	(141.0)	(120.9)	(99.5)	(89)	(80)
Rescheduling Accounts	(1,159.9)	(1,254.3)	(1,243.7)	(1,263.4)	(1,264.6)	(1,257.2)	(1,211.2)	(1,114.1)	(972.9)	(992)	(1,055)
Time Liabilities	(1,343.8)	(1,701.2)	(1,812.6)	(1,951.5)	(2,073.3)	(2,186.3)	(2,217.2)	(2,159.1)	(1,933.7)	(2,023)	(2,308)
Other Liabilities	(824.1)	(915.7)	(890.5)	(929.4)	(947.3)	(1,133.3)	(980.2)	(877.2)	(955.1)	(728)	(1,448)
Net Foreign Assets (Commercial Banks)	592.0	651.2	698.4	806.2	1,142.0	1,154.8	1,230.6	1,611.9	1,303.3	1,523.2	2,076.1
Evaluation Adjustment	7,311.4	7,961.3	7,775.5	7,663.0	7,943.2	8,169.8	7,997.6	7,635.2	7,333.5	7,457.6	7,778.3
Claims on Public Sector	745.9	1,092.2	1,289.0	1,617.6	1,493.9	1,415.9	626.5	915.5	3,967.4	4,968.0	5,359.2
Net Claims on Government	718.1	1,609.7	1,061.0	1,373.6	1,307.6	1,116.7	325.1	459.8	3,109.9	3,959.5	3,662.4
Claims on State and Local Governments	0.0	0.7	0.1	5.3	13.3	12.8	12.8	6.3	4.4	26.3	0.4
Claims on Puplic Enterprises	27.8	81.8	227.9	238.7	173.1	286.4	288.5	449.3	853.2	982.2	1,696.4
Claims on Private Sector	452.9	442.0	870.6	1,304.9	1,803.1	2,821.8	4,217.4	7,431.1	10,583.1	12,285.0	13,692.9
Non Financial Institutions	448.6	438.5	849.7	1,298.7	1,784.2	2,797.2	4,211.6	7,335.9	10,322.5	11,759.3	12,710.7
Non bank Financial Institutions	4.3	3.5	20.9	6.2	18.9	24.6	5.8	95.2	260.6	525.7	982.2
Other Items Net	259.2	310.8	311.8	702.9	636.9	632.5	261.5	(1,369.8)	(2,166.2)	(2,456.1)	(1,576.7)

* Revised figures according to the new presentation of Central Bank of Sudan Balance Sheet.
** Amended figures.
Note; The data changed from Sudanese Dinar (SDD) to SudanesePound (SDG)
100 Sudanese Dinar (SDD) = 1 Sudanese Pound (SDG)

Appendix (II): Inflation rate during the period (1998 – 2008)

Year	Higher Income	Middle Income	Lower Income	Geometric Mean
1998				
End of December	9.2	7.9	8.0	8.2
Annual Average	16.8	17.1	17.6	17.4
1999				
End of December	16.0	17.0	16.8	16.7
Annual Average	16.7	16.0	15.7	15.9
2000				
End of December	3.9	3.3	4.0	3.7
Annual Average	7.9	8.0	8.4	8.1
2001				
End of December	8.3	7.4	6.6	7.4
Annual Average	5.0	4.9	4.8	4.9
2002				
End of December	7.9	8.3	7.8	8.0
Annual Average	9.4	8.3	7.4	8.3
2003				
End of December	7.5	8.3	8.6	8.1
Annual Average	6.6	7.7	7.9	7.4
2004				
End of December	7.9	7.3	7.4	7.5
Annual Average	9.3	8.5	8.5	8.8
2005				
End of December	5.1	5.6	6.1	5.6
Annual Average	7.0	8.5	9.9	8.4
2006				
End of December	16.3	15.4	15.7	15.8
Annual Average	8.1	7.1	6.5	7.2
2007				
End of December	8.1	8.8	8.2	8.4
Annual Average	8.7	8.1	7.6	8.1
2008				
End of December	5.9	7.8	9.5	7.6
Annual Average	11.5	16.2	16.2	14.4

Source: Central Bureau of Statistics

Appendix (III): Currency in Circulation (2003 – 2013)

(SDG Thousands)

End of Period	With Banks	With Public	Total
December-03	118,460	2,402,070	2,520,530
December-04	147,910	3,048,969	3,196,879
December-05	221,080	3,761,340	3,982,420
December-06	315,461	5,355,316	5,670,777
December-07	582,026	5,639,760	6,221,786
December-08	564,578	6,774,569	7,339,147
December-09	766,179	8,066,174	8,832,353
2010			
March	831,852	8,024,938	8,856,790
June	1,077,287	7,939,778	9,017,065
September	976,571	8,311,045	9,287,616
December	829,278	10,067,961	10,897,239
2011			
March	933,137	10,543,245	11,476,382
June	979,808	10,511,472	11,491,280
September	995,136	10,476,037	11,471,172
December	810,092	12,850,083	13,660,175
2012			
March	987,415	12,979,726	13,967,141
June	1,054,288	13,369,821	14,424,109
September	1,297,960	13,897,799	15,195,760
December	1,118,420	16,751,485	17,869,905
2013			
March	1,445,171	16,999,045	18,444,216
June	1,603,479	16,161,060	17,764,539
September	1,241,807	16,823,593	18,065,400
December	1,234,486	19,178,412	20,412,898

Source: Central Bank of Sudan.

Appendix (IV): Money Supply (2003 – 2013)

(SDG Million)

PARTICULAR	31/12/2003	31/12/2004	31/12/2005	31/12/2006	31/12/2007	31/12/2008	31/12/2009	31/12/2010	31/12/2011	31/12/2012	31/12/2013
Money Supply:	7,340.9	9,604.5	14,031.4	17,871.8	19,714.6	22,933.2	28,314.5	35,497.9	41,853.1	58,663.0	66,446.0
Currency With Public	2,402.1	3,049.0	3,740.4	5,355.3	5,639.7	6,774.6	8,066.2	10,068.0	12,850.1	16,751.0	19,178.0
Demand Deposits	2,182.7	2,994.7	4,447.6	5,161.9	5,727.8	6,855.4	8,040.2	9,840.3	12,000.0	14,242.0	16,487.0
Quasi – Money	2,756.1	3,560.8	5,843.4	7,354.6	8,347.0	9,303.2	12,208.1	15,589.6	17,003.0	27,670.0	30,781.0
Net Foreign Assets	(5,699.1)	(3,498.6)	(580.3)	(1,846.0)	(2,540.0)	(2,320.5)	(4,589.7)	(4,020.1)	(5,659.1)	(6,879.4)	(12,266.0)
BOS External Assets	2,297.2	4,203.6	5,804.3	4,298.1	3,552.3	4,077.6	3,180.7	4,044.6	3,671.7	7,717.3	9,496.0
Fund Accounts	(4,153.8)	(4,118.5)	(3,473.7)	(3,180.0)	(3,291.4)	(3,335.8)	(3,480.7)	(3,816.8)	(4,052.2)	(6,665.9)	(8,607.0)
Short Term Loans	(267.3)	(264.7)	(251.5)	(53.0)	(39.0)	(246.0)	(251.2)	(40.3)	(77.4)	(33.4)	(33.0)
Payment Agreements	(153.1)	(141.0)	(120.9)	(99.5)	(89.1)	(79.8)	(62.3)	(57.3)	(61.5)	(102.4)	(136.0)
Rescheduling Accounts	(1,257.2)	(1,211.2)	(1,114.1)	(972.9)	(991.9)	(1,055.4)	(1,082.4)	(1,210.2)	(1,293.6)	(2,130.7)	(2,753.0)
Time Liabilities	(2,186.3)	(2,217.2)	(2,159.1)	(1,933.7)	(2,023.4)	(2,307.5)	(2,418.7)	(2,854.5)	(3,215.9)	(5,525.0)	(7,465.0)
Other Liabilities	(1,133.3)	(980.2)	(877.2)	(1,208.3)	(1,180.7)	(8,121.3)	(8,605.1)	(9,961.5)	(2,343.5)	(3,239.3)	(5,468.0)
Net Foreign Assets (Commercial Banks)	1,154.8	1,230.6	1,611.9	1,303.3	1,523.2	2,076.1	1,168.6	2,242.3	1,713.3	3,100.0	2,700.0
Evaluation Adjustment	8,169.8	7,997.6	7,635.2	7,333.5	7,457.6	7,778.3	8,566.5	9,433.6	8,224.7	15,986.2	24,741.0
Claims on Public Sector	1,415.9	626.5	915.5	3,967.4	4,968.0	5,359.2	8,988.5	13,122.2	17,652.4	22,282.8	33,903.0
Net Claims on Government	1,116.7	325.1	459.8	3,109.9	3,959.9	3,662.4	6,631.6	10,167.1	14,218.2	18,354.0	28,930.0
Claims on State and Local Governments	12.8	12.8	6.3	4.4	26.3	0.4	76.5	145.3	612.8	758.4	969.0
Claims on Puplic Enterprises	286.4	288.5	449.3	853.2	982.2	1,696.4	2,280.5	2,809.7	2,821.4	3,170.4	4,004.0
Claims on Private Sector	2,821.8	4,217.4	7,431.1	10,583.1	12,285.0	13,692.9	16,139.8	17,990.7	19,830.1	27,278.0	33,478.3
Non Financial Institutions	2,797.2	4,211.6	7,335.9	10,322.5	11,759.3	12,710.7	15,513.2	17,372.5	19,426.7	26,965.6	33,034.0
Non bank Financial Institutions	24.6	5.8	95.2	260.6	525.7	982.2	626.6	618.2	403.4	312.4	444.3
Other Items Net	632.5	261.5	(1,369.8)	(2,166.2)	(2,456.1)	(1,576.7)	(790.7)	(1,028.3)	1,805.0	(4.2)	(13,408.0)

Source: Central Bank of Sudan.

Appendix (V): Real Gross Domestic Product (2003 – 2013)

(SDG Millions)

Sectors	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013**
Agriculture, Forests, Animal Resources and Fisheris	6.3	6.2	6.5	6.9	7.5	8.1	8.6	9.2	7.8	8.3	8.6
Petroleum	1.1	1.3	1.5	1.6	2.4	2.3	2.3	2.2	1.8	0.6	0.8
Mining and Quarrying	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.05	0.2	0.2
Processing and Handcraft	1.9	2.1	2.2	2.3	2.6	2.8	3.0	3.2	3.5	4.1	4.2
Electricity and Water	0.2	0.4	0.4	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7
Building and Construction	0.4	0.5	0.6	0.7	0.7	0.8	0.9	1.0	0.9	0.9	0.9
Trade, Hotels and Restaurants	1.6	1.6	1.7	1.8	1.9	2.0	2.2	2.3	2.4	2.4	2.5
Transport and Communications	1.7	1.8	2.0	2.1	2.3	2.5	2.7	2.9	2.8	3.0	3.0
Finance, Insurance, Real Estate and Other services	2.3	2.3	2.5	2.7	2.9	3.1	3.3	3.4	3.3	3.4	3.4
Community and other Social Services	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3
Financial intermediation service	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.5)	(0.5)	(0.5)
Government Services	2.4	2.5	2.6	3.3	3.5	3.7	3.8	3.8	3.1	3.2	3.2
Non-profit private households services	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Import Charges	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
GDP at constant prices	18.3	19.3	20.3	22.4	24.8	26.4	28.0	29.4	27.0	27.1	28.1
GDP Deflator	3,042.9	3,568.6	4,094.4	4,322.1	4,297.6	4,723.1	4,853.5	5,517.1	6,914.4	8,984.5	10,485.1
GDP at Current Prices	55,733.8	68,721.4	83,298.0	96,611.5	106,527.0	124,609.1	135,659.0	162,203.9	186,689.9	243,412.8	294,630.2
Growth Rate	6.3	5.1	5.6	9.9	10.9	6.4	5.9	5.2	1.9	1.4	3.6

Source: Central Bureau of Statistics.

Sectors	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013**
Agriculture, Forests, Animal Resources and Fisheris	21,411.0	23,369.4	28,454.7	31,190.8	32,985.5	37,480.6	44,969.6	52,691.4	63,609.1	80,675.2	99,681.4
Petroleum	3,811.6	4,760.7	6,461.2	9,478.0	10,121.7	16,654.6	9,621.2	15,654.2	9,248.4	8,095.1	8,962.3
Mining and Quarrying	119.6	120.1	157.0	191.6	212.1	272.0	309.8	364.8	2,179.8	4,751.9	5,807.8
Processing and Handcraft	4,862.1	6,392.5	7,322.3	8,041.7	8,781.9	9,726.3	11,508.2	13,672.9	16,285.4	21,676.8	26,101.0
Electricity and Water	128.7	828.9	1,070.8	1,819.6	1,981.4	2,242.4	2,513.0	2,894.3	1,606.1	2,181.1	2,643.5
Building and Construction	2,136.3	2,614.5	3,824.0	4,242.7	4,650.5	5,239.3	6,171.2	7,457.6	8,717.7	11,525.3	13,866.1
Trade, Hotels and Restaurants	8,643.7	10,773.1	12,662.9	14,328.0	16,727.8	18,376.2	21,107.6	24,827.4	30,708.8	40,719.9	48,664.4
Transport and Communications	5,580.9	8,410.5	10,092.5	11,671.9	13,781.2	15,045.5	17,076.2	19,835.4	24,425.6	32,510.5	39,178.4
Finance, Insurance, Real Estate and Other services	4,387.2	5,340.1	6,597.6	7,613.0	7,808.9	8,961.1	10,399.1	11,860.8	14,531.4	18,910.9	22,712.0
Community and other Social Services	854.6	916.7	994.6	1,118.6	1,258.2	1,393.5	1,522.6	1,735.0	1,968.0	2,564.3	3,064.6
Financial intermediation service	(379.7)	(546.7)	(884.0)	(1,026.1)	(719.6)	(789.3)	(872.7)	(1,417.9)	(1,625.2)	(2,122.6)	(2,549.2)
Government Services	2,661.7	3,845.6	4,269.1	5,297.4	5,943.7	6,680.6	7,481.6	8,362.4	9,998.4	15,248.2	18,465.6
Non-profit private households services	669.0	707.9	744.3	861.0	996.4	1,109.3	1,206.7	1,309.1	1,501.5	1,953.5	2,351.0
Import Charges	847.0	1,188.0	1,531.0	1,783.4	1,997.4	2,217.1	2,645.1	2,956.6	3,535.0	4,722.7	5,681.4
GDP at Current Prices	55,733.8	68,721.4	83,298.0	96,611.5	106,527.0	124,609.1	135,659.0	162,203.9	186,689.9	243,412.8	294,630.2

Source: Central Bureau of Statistics.