IMPACT OF MONETARY POLICY ON SOCIOECONOMIC INDICATORS: A CASE STUDY OF DEVELOPING COUNTRIES

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Author's Declaration

I **Zeeshan Fazal** hereby state that my MPhil thesis titled **IMPACT OF MONETARY POLICY ON SOCIOECONOMIC INDICATORS: A CASE STUDY OF DEVELOPING COUNTRIES** is my own work and has not been submitted previously by me for taking any degree from Pakistan Institute of Development Economics or anywhere else in the country/world.

At any time if my statement is found to be incorrect even after my Graduation the university has the right to withdraw my MPhil degree.

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DEDICATION

Dedicated to Dr. Atiq-ur-Rehman and all of my previous teachers who gave me moral support through thick and thin.

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In the name of Allah, the Most Gracious and the Most Merciful.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Monetary policy is primarily used to control inflation and to stabilize the economy but is usually conducted without keeping in perspective of socioeconomic consequences. But in reality monetary policy is associated with number of socioeconomic indicators such as unemployment; poverty and inequality. The literature shows that monetary policy can have an impact on socioeconomic indicators. However, the phenomenon by which monetary policy impact socioeconomic indicators cannot get due attention of the researchers due to which results suffer numerous estimation problems of missing variables bias and simultaneity bias. Our study has explored the impact of monetary policy on socioeconomic indicators with the help of structural equation modeling taking into account variety of causal channels present in literature in which monetary policy affects socioeconomic indicators. For this purpose cross sectional data of year 2005 and 2015 is taken for 61 and 57 countries respectively of the variables involved in different channels of monetary policy. We conclude that monetary policy significantly impact socioeconomic indicators.

LIST OF ABBREVIATIONS

MTM	Monetary Transmission Mechanism
i	Interest Rate
M	Money supply
$P_X{}^{FC}$	Price of Exports
P_M	Price of Imports
I	Investment
C	Consumption
Y	Output
P_{Equity}	Equity Prices
HL	Household long term assets
W	Wealth
P	Prices
PHR	Poverty headcount ratio
GI	Income Inequality
UEM	Unemployment
SEI	Social Economic Indicators
E	national currency units per SDR
Π	inflation

CHAPTER 1

INTRODUCTION

1.1 Introduction

Monetary policy is primarily used to control inflation and to contribute towards stability of economy but it is conducted without keeping in perspective of socioeconomic consequences. But in reality, monetary policy is strongly associated with a number of socioeconomic variables.

The literature shows that monetary policy can have impact on socioeconomic indicators (SEI) such as poverty, employment and inequality. There are many channels through which Monetary policy affects SEI. Consider interest rate Channel, which in tight monetary policy increases the interest rate to a very high level which reduces investment and overall employment. This leads to the extreme loss and suffering of the poor (Galbirth, 1998). Financial market channel generate extra wealth for the financers during expansionary Monetary policy (Coibion et al 2017).While Romer and Romer (1999) have shown three channels in short run and five channels in long run effecting SEI. In short run firstly, the rise in average income reduces poverty as a result of expansionary Monetary policy. Secondly, it reduces unemployment by concentrating disproportionately among low skilled workers. Thirdly, inflation due to expansionary Monetary policy reduces real value of wage. In the long run, high inflation creates uncertainty, generates future expectation of instability, distortionary policies, disrupts financial markets, discourages investment and retard growth resulting in eroding country's average standard of living thus effecting SEI.

The theoretical literature shows that there are many causal channels which describe relation between monetary policy and socioeconomic indicators. However, the phenomenon of relation between monetary policy and socioeconomic indicators cannot get due attention of researcher and still there is limited literature on the issue. The few empirical studies on relation between monetary policy and socioeconomic indicators have found strong evidences favoring relationship. While existing studies relate two types of

variables by single equations. However, these empirical evidences suffer numerous estimation problems of missing variables bias and simultaneity bias. Appropriate method is to estimate a complex causal mechanism involving multiple paths with the help of multiple linear equations using structural equation modeling.

The purpose of our study is to explore the effect of monetary policy on SEI with the help of structural equation modeling taking into account variety of causal channels present in the literature in which monetary policy affects SEI. With this aim, the relationship between monetary policy and SEI needs to be explained by a system of linear equations.

1.2 Research Objective

To analyze the impact of monetary policy on income distribution (GI) and poverty in the developing countries using the methodology that takes into account the multiple causal paths. Moreover , we will also see the impact of monetary policy on unemployment and inflation.

1.3 Significance of Study

Monetary policy has an impact on several SEI as empirically shown by many researchers. But their relation cannot be explained by a linear equation rather multiple linear equations are required to find unbiased results. Monetary policy impacts poverty and inequality through various channels i.e. through interest rate channel, credit channel, other assets price channel, exchange rate channel, expectation channel and cost channel. This research will help to empirically find this complete chain in which monetary policy impacts poverty and inequality with the help of multiple linear equations using structural modeling. These results will be free of the missing variable bias and simultaneity bias (see section 4.2).

These SEI are important for many reasons including the fact that they are part of sustainable development goals (SDG). The goals are set for year 2030 in United Nations

General Assembly in 2015 for the year 2030.Among these 17 goals few of these are no poverty, zero hunger, reduced inequality and decent work and economic growth.

1.4 outline of Thesis

Chapter two discusses relationship of monetary policy with SEI. Channels of monetary policy are discussed which effects SEI.

Chapter three discusses theoretical and empirical studies of monetary policy linking with SEI.

Chapter four provides the methodology and data description.

Chapter five talks about our empirical results and compare both results of year 2005 and 2015 carefully.

CHAPTER 2

LINKAGE BETWEEN MONETARY POLICY AND SOCIOECONOMIC INDICATORS

2.1 Chapter's outlines

2.1 Linkage between monetary policy and socioeconomic indicators

2.2 effect of monetary policy on socioeconomic variables

There are many channels through which monetary policy can affect the economy, but researchers have mostly related it to inflation ,GDP growth and unemployment. This study includes the empirical discussion of channels to poverty, inequality and unemployment. Monetary policy can potentially affect income inequality, poverty and unemployment through different channels as in Christopher J. Niggle (1989), which are summarized as below.

2.1.1 Interest Rate Channel

Galli (2001) discussed the impact of monetary policy on income distribution through different channels both in the short run and in the long run as increase in interest rate stops the progress of economic growth with rise in unemployment rate, affecting different workers at various levels specially the low skilled workers as a result income inequality will raise in short run.

Monetary policy has an impact on income distribution in the short run through real interest rates. Both nominal interest rate and real interest rate increases with decrease in money supply. The increase in real interest rate will make the net borrowers worse off and the net lenders better off; as a result, income inequality expands because certainly there are more net lenders are at the top of income distribution as compared at the bottom.

2.1.2 Income Composition Channel

The fact is that families are heterogeneous in terms of their key sources of earnings. While most households depend mainly on labor income, others earn higher income shares from company and financial income. If expansionary monetary policy shocks increase more profits than salaries, then those with business ownership claims tend to benefit disproportionately. Since the latter also tends to be wealthier (a fact we verify in our data), in response to monetary policy shocks, this channel should lead to higher inequality (Coibion et al 2017)

2.1.3 Financial Segmentation Channel

If some entities commonly trade in economic markets and are impacted before other agents by fluctuations in the money supply, then a rise in the money supply will redistribute wealth to those entities most linked to economic markets, as in Williamson (2009) and Ledoit (2009). To the extent that agents who actively engage in economic trades have on average greater incomes and consumption than unrelated agents, this channel also means that inequality in consumption should increase after expansionary monetary policy shocks.

2.1.4 Portfolio Channel

By raising financial asset prices, a fall in the interest rate can also affect balance sheets of households through differences in the composition of the portfolio of assets (Coibon et al. 2017; Inui et al. 2017). Higher equity prices result in capital gains that benefit high-income households who hold most of financial assets. This raises wealth inequality. At the same time, higher house prices increase the value of real estate assets; this could have equalizing effects if homeownership is broadly distributed among the population, or escalate wealth inequality if homeownership is concentrated at the top end of the wealth distribution.

2.1.5 Savings Redistribution Channel

An unexpected rise in interest rates or fall in inflation will benefit savers and harm borrowers as in Doepke and Schneider (2006), leading to a rise in consumer inequality (to the extent that depositors are usually wealthier than debtors)

2.1.6 Earnings Heterogeneity Channel

For most families, labor income is the primary source of revenue, and these earnings can react differently to monetary policy shocks for high-income and low-income households. For instance, this could happen if unemployment drops disproportionately on low-income groups, as Galbraith (1999) suggested and described in Carpenter and Rodgers (2004). Similar impacts could occur for employees in the presence of different levels of wage rigidity throughout the income distribution (e.g. from unionization in manufacturing but not management), variable degrees of complementarity / substitution with physical capital depending on the ability sets of agents (because interest rates impact the relative price of capital and labor), or different endogenous labor. As mentioned in Heathcote et al. (2010) document that the labor income at the bottom of the distribution is most affected by fluctuations in the business cycle. Because low-income households earn a bigger share of their revenue from money transfers (e.g. unemployment benefits, food stamps) than other families on average and because money transfers tend to be countercyclical, this element of revenue heterogeneity could lead to decreased income inequality following expansionary monetary policy shocks.

2.1.7 Cost Channel

MTM's cost channel is based on the premise that companies hold working capital and companies must borrow before their profits for payment of their production factor. Christiano et al. (1992, 1995) and Ravenna and Walsh (2006) presumed that companies had to pay their production factors before their income. Companies borrow loans from

financial intermediaries for the advance payment to their production factor. When central bank announces tight monetary policy the short-term interest rate rises that directly increases the working capital expenses of companies (Lima, 2010). Even if companies raise their funds from inner resources; interest rate impacts the opportunity cost of working capital (Barth & Ramey, 2001). Due to rises in capital cost; increases in marginal manufacturing cost. Increasing marginal costs raises the company's manufacturing costs and consequently raises the company's prices. Influenced by higher interest rates, firms make price decisions. Companies are increasing prices with interest rate increases because their marginal production costs are directly influenced by interest rates (Hulsewig et al. 2009). Barth and Ramey (2001) discovered that many companies had risen prices in the US economy following monetary shocks. Whereas Dedola and Lippi (2005) Fabiani et al. (2006) and Gaiotti and Secchi (2006) discovered that companies in European nations, Euro Area and Italy have changed prices after interest rate changes respectively. Increasing cost production, on the other hand, forces companies to cut their production as a consequence of price rises leads to a massive decrease in output. The rise in firms 'prices ultimately raises the economy's general price level. According to Ramey (2001) cost of working capital significantly affects the prices, Output and other actual economic operations.

$$M \downarrow \rightarrow i \uparrow \rightarrow cost\ of\ working\ capital \uparrow \rightarrow MC \uparrow \rightarrow Cost\ Of\ Production \uparrow \rightarrow Y \downarrow \rightarrow \pi \uparrow$$

2.1.8 Credit Channel

MTM's credit channel describes how monetary policy change affects the real economy through the amount of credit banks provide for investment and consumption purposes to firms and consumers. The credit channel stems from the inability of the interest rate channel to explain the impact of monetary policy on actual economic factors and this failure is a result of the heroic premise of free capital markets for friction. The credit

channel theory can solve these issues of economic frictions and the impacts of the monetary transmission mechanism can be compensated by the two sub-channels. The bank lending channel and the balance sheet channel can solve the empirical mysteries left by the channel of interest rates, according to Bernanke (1995).

a) Bank Lending Channel;

b) Balance Sheet Channel.

a) Bank Lending Channel

Because of the credit market and the excessive presence of bank-dependent borrower, the bank lending channel is more important for developing nations as in Buigut (2010).

$$M \downarrow \rightarrow i \uparrow \rightarrow bank\ deposits \downarrow \rightarrow bank\ loans \downarrow \rightarrow I \downarrow, C \downarrow \rightarrow Y \downarrow$$

This channel of bank lending is more important for developing nations because financial markets are in infancy and large numbers of productive companies are bank-dependent (Buigut 2010).

b) Balance Sheet Channel

Central banks announce a tight monetary policy that decreases agents ' readiness to pay for equity, leading to a decrease in the company's equity price (Mishkin 1995). Net decrease in the company's balance sheet increases adverse selection and moral hazards as banks feel uncertain about giving loans to such companies because of their net worth or because of the accessibility of proper collateral. To prevent this expensive screening process banks decrease credit supply as a consequence of a decrease in complete demand and ultimately production. A balance sheet channel intensifies the original decrease in production and expands it (Ireland 2005).

$$M \downarrow \rightarrow P_e \downarrow \rightarrow adverse\ selation \uparrow \&\ moral\ hazrads \uparrow \rightarrow lending \downarrow \rightarrow I \downarrow \rightarrow Y \downarrow$$

For the period 1980-2012, the relationship between total banking sector loan quantity and unemployment in 14 chosen European Union countries was evaluated using a panel data analysis technique which takes into account structural breaks and cross-section dependency. As a consequence of the study, the impact of loan rises on the unemployment rate in these nations has been reduced. (Göçer, I., 2013)

2.1.9 The Exchange Rate Channel

In open economies changes in the policy induced nominal interest rate may also affect through the exchange rate channel (Ireland 2005). The exchange rate channel influences the economy via both aggregate supply and aggregate demand as in Ozdogan (2009).

On the demand side, central bank adopts tighter monetary policy which leads to increases the nominal interest rate which further increases the real interests; as a result, domestic currency appreciates due to increase in capital inflow (Norrbin 2000). As a result of this appreciation of domestic currency; domestic goods become more expensive than foreign goods. Due to increase in prices of domestic goods their demand decreases as result net export decreases which further decreases aggregate demand and finally output. Taylor (1993, 1995), Obstfeld and Rogoff (1995) and Kandil (2004) concluded that appreciation in domestic currency increase the price of domestic produced goods which decreases net exports and hence domestic output.

$$i \uparrow \rightarrow r \uparrow \rightarrow E \uparrow \rightarrow P^{dg} \uparrow, P^{fg} \downarrow \rightarrow NX \downarrow \rightarrow Y \downarrow$$

On the supply side, central bank decreases the nominal interest rate which further decreases the real interests as a result domestic currency depreciates due to uncovered

interest rate parity condition[1].As a result of this real depreciation of domestic currency directly decreases an imports price which increases firm's cost of production and retail prices of import prices based goods and services. Bruno (1979) and van Wijnbergen (1989) proposed that firms' input cost of imported input based industries increases after a depreciation of currency. Increases in import based goods and services puts positive impact on domestic price level and hence domestic inflation (Bank of England 2012).

$i \downarrow \rightarrow r \downarrow \rightarrow E \downarrow \rightarrow Pm \uparrow \rightarrow Y \downarrow \rightarrow \pi \uparrow$

2.1.10 Expectation Channel

Expectations about inflation plays very important role for decision making process.

Expectation channel describes how monetary policy actions affect the expectations of agents about inflation and other real variables of economy. While making decisions about prices and wages economic agents observes the current rate of inflation as well as its effects on future expected inflation. The effects of this channel is uncertain because it depends upon expectation of agents which may be different from each other. According to Ali (2010) there are three different types of expectations may be expected by agents.

(a) Distributed lag expectations is a kind of expectations when agents expect that inflation to be decreased in the future

(b) Bandwagon expectations are also known as forward-looking price-setting behavior of firms. Firms expect inflation to be increased in the future.

[1] "The link between monetary policy and exchange rates under the Uncovered Interest Parity (UIP) condition has gained increasing attention since the studies of Fleming (1962), Mundell (1963), and Dornbusch (1976)" Ozdogan (2009)

(c) Static expectations is a kind of expectations when agents expect that inflation to be stayed at its current level.

For the expectation of inflation, the credibility of central banks plays very important role. If public is fully confident about the central banks that they are capable to attain the numerical target of inflation as mentioned by banks in case of inflation targeting regime the announced target can be achieved. If public is not confident about the credibility of central banks, then inflation expectations may deviate from the target.

The central banks take an action and change the official interest rate which changes the confidence expectations of the economic agents for the future price level and economic performance of country and they determine price level on the basis of their expectations. Generally, this channel Focus on firms' forward-looking price-setting behavior. If firms guess that prices will rises in future, they start to increase current prices as result this expected future inflation increases; an increases in inflation not only increases inflation in future but also from the present.

$$i \uparrow \rightarrow M \downarrow \rightarrow P_e on\ equity, property\ \&\ land \downarrow \rightarrow WEALTH \downarrow \rightarrow C \downarrow AND\ I \downarrow \rightarrow Y \downarrow \rightarrow \pi \uparrow$$

2.1.11 Asset Price Channel

Assets price channel describes how monetary policy effects on shares and bond, share prices through asset price channel. Asset price channels are highlighted by two famous theories of Ando and Modigliani (1963) life cycle theory of consumption and Tobin (1969) q-theory of investment (Ireland, 2005). The Tobin's q theory postulates the effects of monetary policy through the valuation of equities. Tobin q theory states that higher value of q raises the market value of firm as relative to the replacement cost of new capital and vice versa (Mishkin 1995).

Tobin's q measures: $Q = \frac{Stock\ Market\ Value\ of\ Capital}{Replacement\ Cost\ of\ the\ Physical\ Capital}$

(a) Equity Price effects on Investment

With the announcement of tight monetary policy; central banks increase short term nominal interest rate as a result all debt instruments become more attractive for investors as compared to equities (Ireland 2005) which leads to decreasing equity prices (Ireland 2005). When value of q is lower; the stock market value of firm capital decreases as a result firms do not issue more new equities which leads to decrease investment spending as a result output also decreases

(Mishkin 1995). $M \downarrow \rightarrow i \uparrow \rightarrow P_e \downarrow \rightarrow q \downarrow \rightarrow I \downarrow \rightarrow Y \downarrow$

(b) Wealth effects on consumption

A wealth effect on consumption spending was to be considered an alternative or separate channel of MTM and wealth has been considered important factor of household's lifetime resources._Wealth effects on consumption channel have been strongly advocated by the Modigliani (1963).

According to Ando and Modigliani's (1963) life cycle theory of consumption an increase in interest rate decrease the household's long-term assets. As a result, financial wealth of house hold decreases which further decreases consumption expenditure and the hence output.

$M \downarrow \rightarrow i \uparrow \rightarrow P_e on\ equity, property\ \&\ land \downarrow \rightarrow wealth \downarrow \rightarrow consumption \downarrow \rightarrow I$

$\downarrow \rightarrow Y \downarrow$

2.2 Effect of Monetary Policy on Socioeconomic Variables

Monetary policy has many channels through which it affects inflation, output and employment. These variables affect income and poverty so monetary policy affects socioeconomic variables indirectly. The following researchers are in favor of the above arguments. Coibion et al. (2012) has empirically proven monetary policy affects inequality. Romer and Romer (in 1999) have shown that monetary policy affects poverty. Giovannoni and Russo (2007) have shown that monetary policy has significant causal impact on income inequality. Rossana Galli (2001) has shown monetary policy and inflation affects inequality.

CHAPTER 3

LITERATURE REVIEW

Chapter's outline

3.1 Empirical Literature

3.2 theoretical Literature

3.3 Literature Gap

Asia's fast economic growth in latest decades has significantly contributed to poverty reduction, but has also been accompanied by an increasing income gap in many nations. Zhuang, Kanbur, and Maligalig (2014) report that the Asia-wide Gini ratio grew at an annual pace of 1.4% from.39 in the mid-1990s to.46 in the early 2000s;14 out of 37 Asian countries now have a Gini coefficient of.40 or higher, commonly regarded as the ' high inequality ' threshold.

Although the Gini coefficients in developing Asia are lower on average than in sub-Saharan Africa, Latin America and the Caribbean, inequality is greater: 12 out of 30 Asian developing economies, covering 82% of the region's population, have worsened the Gini coefficient in the last two decades, with the most marked increase in the People's Republic of China and Indonesia. Inequality has risen in Asian nations over the past three decades. In latest decades, the gap between rich and poor in China has risen considerably as the economies boomed (Asian Development Bank). Oxfam's study also disclosed that nearly half of the world's wealth is now owned by just 1% of the population and 7 out of 10 individuals live in nations where economic inequalities have deteriorated over the previous 30 years.

Sixty of the poorest nations in the world have paid $550 billion in principal and interest on loans of the same cash over the previous three decades and yet they owe a massive $523 billion on the same loan they already have paid. The interest these countries paid

are more than they spend on health or education and is twenty times the amount of their foreign aid (Perkins, J., 2016). On the other side rich got loan waivers, one of the examples is Pakistan where rich got Rs.85 billion written off only during 2002-2007 (Pak tribune 2 December, 2009).

Economists consider monetary policy as a tool to stabilize economy and to control inflation but effects of monetary policy on SEI are ignored. The Literature Review is divided into empirical and theoretical studies which are summarized as under.

3.1 Empirical Literature:

Studies like Coibion et al. (2012) has empirically found the contribution of monetary policy shocks to consumption and income inequality in the United States since 1980. Contractionary monetary policy causes systematically increase inequality in labor earnings, total income, consumption and total expenditures. Furthermore, monetary shocks can account for a significant component of the historical cyclical variation in income and consumption inequality. Using detailed micro level data on income and consumption, they document the different channels via which monetary policy shocks affect inequality, as well as how these channels depend on the nature of the change in monetary policy. Romer and Romer (in 1999) have shown that inflation created by expansionary monetary policy harms the poor by reducing real value of wage and money transfer whereas in tight monetary policy interest rate goes up, investment coupling with employment will decrease as a result poor masses will be the ultimate losers. They have shown in panel data study that impact of monetary policy on both socio economic variables i.e. poverty and inequality in short as well as long run; and conclude that monetary policy with lower inflation rate and stabilized aggregate demand improve the situation of poor. Galbraith, Giovannoni and Russo (2007) have shown that monetary policy has significant causal impact on income inequality i.e. it extends beyond inflation

and unemployment. They used a VAR model of the American economy from 1984 to 2003, they find that, contrary to official claims, the Federal Reserve does not target inflation or react to "inflation signals." Rather, the Fed reacts to the very "real" signal sent by unemployment, in a way that suggests that a baseless fear of full employment is a principal force behind monetary policy. Tests of variations in the workings of a Taylor Rule, using dummy variable regressions, on data going back to 1969 suggest that after 1983 the Federal Reserve largely ceased reacting to inflation or high unemployment, but continued to react when unemployment fell "too low." Further, they find that monetary policy (measured by the yield curve) has significant causal impact on pay inequality—a domain where the Fed refuses responsibility. Finally, they test whether Federal Reserve policy has exhibited a pattern of partisan bias in presidential election years, with results that suggest the presence of such bias, after controlling for the effects of inflation and unemployment.

There is some evidence that higher unemployment is linked with higher real interest rate Fitoussi *et al* (2000) and Blanchard &Wolfers (2000). Monetary policy shocks will impact both real interest rates and unemployment, generating correlations between the two variables which are far from structural.

Rossana Galli (2001) asserted that the impacts on inequality of monetary policy and inflation rely on the original inflation rate. While restrictive monetary policies are often helpful to inequality in high-inflation nations, lowering inflation in originally low-inflation economies may boost inequality.

There are three different implications of monetary policy. If the demand side effect of the monetary transmission mechanism (MTM) is more efficient than it could be justified to use the interest rate as a policy instrument. But if the cost channel is more efficient than interest-based monetary policy, instead of enhancing it, it would worsen the scenario. If

the two kinds of impacts cancel each other, then monetary policy based on interest rates would be useless in controlling inflation. However, the side effect of interest rate increase is a massive, strictly undesirable decrease in production. The use of interest rates to regulate inflation is only justified if there is a dominant demand side effect. But, as in Felipe (2009) and Rehman & Malik (2010), there are numerous evidence against this dominance. However, the impact of interest rate on production is negative, therefore not desirable, even in the presence of MTM's demand side effect. If demand side effect is dominant or if supply side effect is dominant, the production will be negatively impacted by interest rate appreciation in both instances. In brief, elevated interest rates are an investment obstacle and therefore have an impact on jobs.

In short, monetary policy is conducted without taking any care of socioeconomic indicators which in this case are poverty and income inequality. The relation between monetary policy and inflation is discussed by many researchers. The impact of inflation on inequality is also discussed but the complete chain of monetary policy affecting income inequality and poverty indirectly is not discussed.

3.2 Theoretical Literature:

Theoretically there are many channels supposed to effect poverty and inequality indirectly (as shown in figure 1) for e.g. Mishkin (1995, 1996 and 2005). Taylor (1995) and Ireland (2005) describe how the monetary policy effects the real variables especially inflation and output through different Monetary transmission mechanism (MTM) channels. Our purpose of research is to empirically see the relationship through these channels instead of direct linkage between two variables which will miss variables in between them and causes results to be bias.

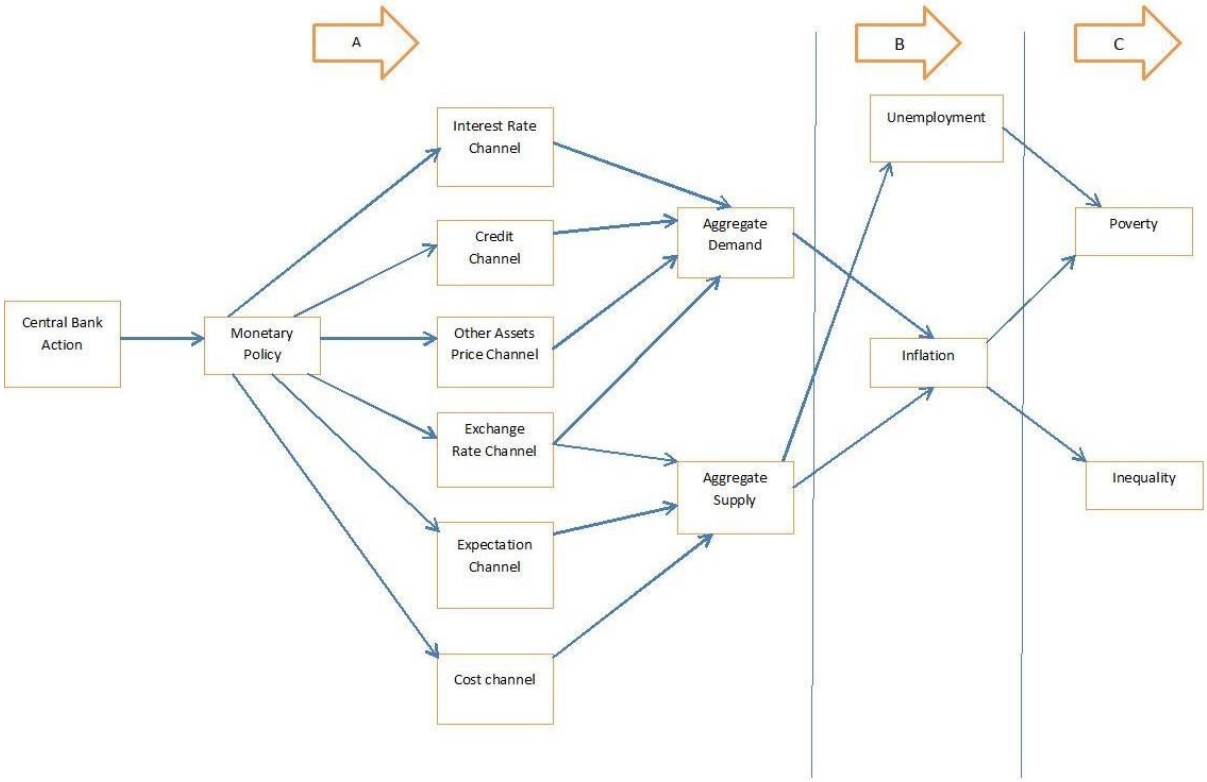

Figure: 3.1 The Channel of MTM (Mishkin (1995, 1996 and 2005)

3.3 Literature Gap

Earlier researchers have explored either Panel A & B or Panel B & C as shown in figure.1 but no one considered or explored complete causal linkage between monetary policy and poverty or inequality empirically. There is less literature on the impact of monetary policy on SEI which includes all these panels.

CHAPTER 4

METHODOLOGY AND DATA DESCRIPTION

The current research seeks to investigate the effect of monetary policy on income distribution and poverty in the world's developing countries.

4.1 Variables of Monetary transmission mechanism (MTM)

There is a causal chain of monetary policy impacting poverty and inequality through different channels. We will use three types of variables.

1. Input Variables

Input variables mean the input of monetary policy.

These are inputs of monetary policy, namely interest rate (i) and money supply (M).

2. Intermediate Variables

Intermediate variables are those variables which have relationship with output variables but are not direct inputs of monetary policy. These variables are not the direct input of monetary policy, rather these are consequences of the inputs of monetary policy and may affect the output variables. These include foreign currency value of domestic currency(E), Foreign currency price of exports(P_X^{FC}), foreign currency price of imports (P_M), investment (I), consumption (C),output (Y),equity prices (P_{Equity}),household long term assets (HL), wealth (W) and prices (P).

3. Output Variables

Output variables; which are poverty (PHR), Inequality (GI), Inflation (π) and unemployment (UEM).

The figure 4.1: shows relation between these three types of variables.

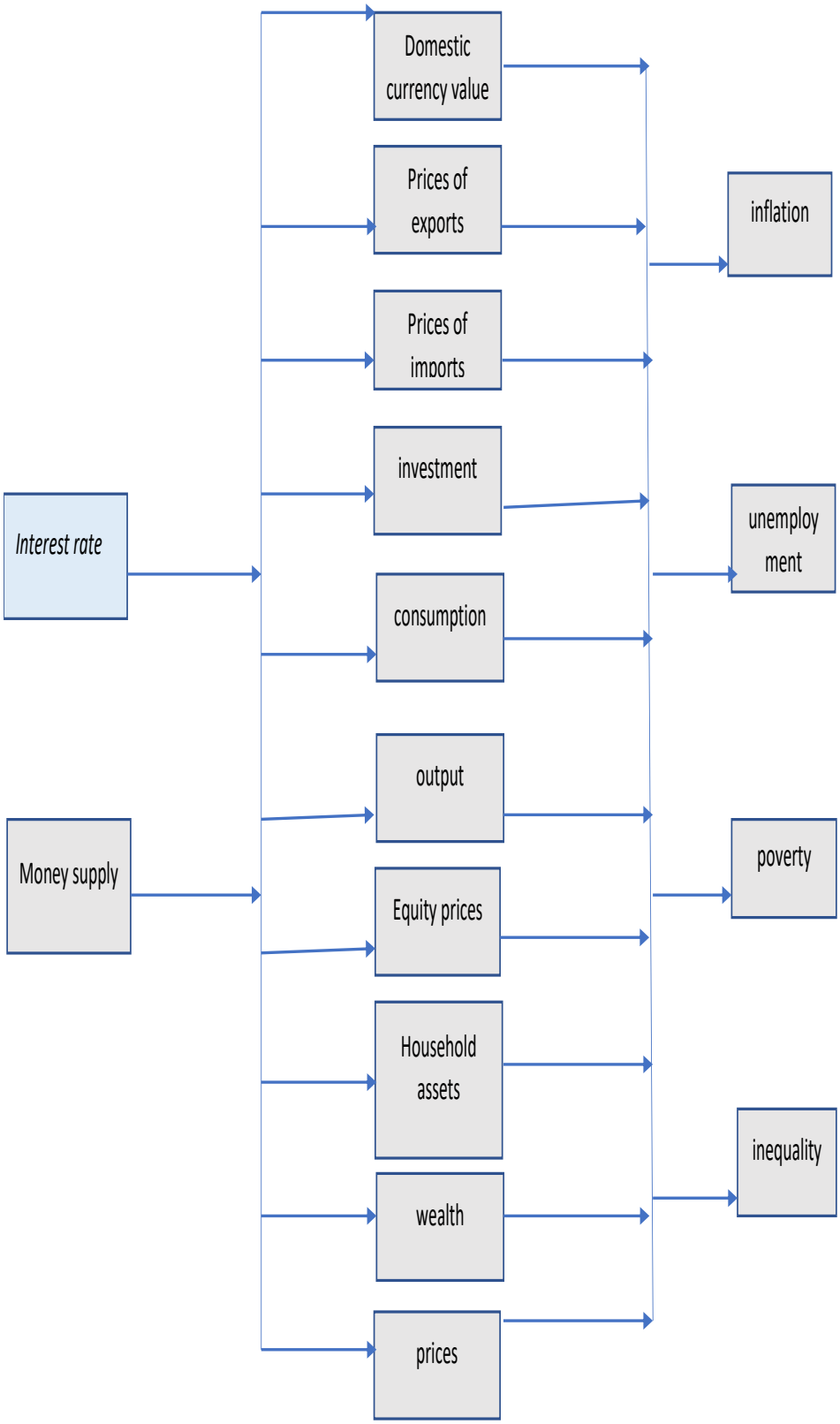

Figure 4.1: Determinants of output variables

The figure 4.1 explains how input variables effect intermediate variables and then output variables. It includes all variables explained above.

4.2 Structural Equation Modeling (SEM)

In literature review, we have observed that:

1) The monetary policy input-output relationship cannot be described as a single equation relationship. Each of the above described inputs of the policy effects intermediate variable that simultaneously affects output variables (SEI). Therefore, to define the relationship between the outputs of monetary policy and SEI, an equation system is required.

2) If any of the variables in an equation system are estimated by ignoring the other equations, then the estimates are subject to missing variable bias.

Therefore, we have chosen Structural Equation Modeling for quantifying the relation between monetary policy and socioeconomic indicators. The structural equation modeling is capable of estimating the system of equation such as the above mentioned system can be estimated simultaneously without the endogeneity or missing variable bias, (Kupek, 2006; Kline, 2011)**.**

4.3 Modeling Determinants of outputs (Inflation, Unemployment, Poverty and Inequality) of Monetary Policy

The main inputs of monetary policy are the interest rate and money supply. However, these inputs do not directly affect the output variables as mentioned above; rather they affect the intermediate variables which in turn affect the output variables. These intermediate variables may be mutually interdependent. Therefore, the causal chain between the inputs and the output of monetary policy chain forms a complex chain of structural equation which we are mentioning below. Equations (1-10) show input variables i.e. interest rate and money supply have linear relation with all ten

intermediate variables i.e. domestic currency (E), Foreign currency price of exports (P_X^{FC}), foreign currency price of imports (P_M), investment (I), consumption (C), output(Y), equity prices(P_{Equity}),household long term assets (HL), wealth (W) and prices (P).Similarly equations (11-14) show the relation of output variables i.e. Output variables; which are poverty (PHR), Inequality (GI), Inflation (π) and unemployment (UEM) with the intermediate variables.

First Equation describes that foreign currency value of domestic currency (E) depends linearly on interest rate (i) and money supply (M).

$$E = a_{11}i + a_{12}M + e_1 \quad (1)$$

Equation (2) explains that Foreign currency price of exports (P_X^{FC})linearly depends on interest rate (i) and money supply (M) i.e.

$$P_X^{FC} = a_{21}i + a_{22}M + e_2 \quad (2)$$

Equation (3) shows that foreign currency price of imports (P_M) linearly depends on interest rate (i) and money supply (M) i.e.

$$P_M = a_{31}i + a_{32}M + e_3 \quad (3)$$

Equation (4) shows that investment (I) linearly depends on interest rate (i) and money supply (M) i.e.

$$I = a_{41}i + a_{42}M + e_4 \quad (4)$$

Equation (5) shows that consumption (C) linearly depends on interest rate (i) and money supply (M) i.e.

$$C = a_{51}i + a_{52}M + e_5 \quad (5)$$

Equation (6) shows that output (Y) linearly depends on interest rate (i) and money supply (M) i.e.

$$Y = a_{61}i + a_{62}M + e_6 \quad (6)$$

Equation (7) shows that equity prices (P_{Equity}) linearly depends on interest rate (i) and money supply (M) i.e.

$$P_{Equity} = a_{71}i + a_{72}M + e_7 \quad (7)$$

Equation (8) shows that household long term assets (HL) linearly depends on interest rate (i) and money supply (M) i.e.

$$HL = a_{81}i + a_{82}M + e_8 \quad (8)$$

Equation (9) shows that wealth (W) linearly depends on interest rate (i) and money supply (M) i.e.

$$W = a_{91}i + a_{92}M + e_9 \quad (9)$$

Equation (10) shows that prices (P) linearly depends on interest rate (i) and money supply (M) i.e.

$$P = a_{101}i + a_{102}M + e_{10} \quad (10)$$

Equation (11) will show the linear regression of output variable inflation (π) and all the intermediate variables.

$$\pi = b_{11}E + b_{12}P_{X^{FC}} + b_{13}P_M + b_{14}I + b_{15}C + b_{16}Y + b_{17}HL + b_{18}W + b_{19}P_{Equity} + b_{10}P + e_{11} \quad (11)$$

Equation (12) will show the linear regression of output variable unemployment (UEM) and all the intermediate variables.

UEM= c_{11}E+ c_{12} P_X^{FC} + $c_{13}P_M$ + c_{14} I + c_{15} C+ c_{16} Y + c_{17}HL + c_{18}W + c_{19} P_{Equity} + c_{10}P +e_{12}. (12)

Equation (13) will show the linear regression of output variable poverty (PHR) and all the intermediate variables.

PHR=d_{11}E+$d_{12}P_X^{FC}$+$d_{13}P_M$+d_{14} I+d_{15} C+d_{16}Y+ d_{17}HL+ d_{18}W+d_{19} P_{Equity}+d_{10}P+e_{13}. (13)

Equation (14) will show the linear regression of output variable income inequality (GI) and all the intermediate variables.

GI= e_{11}E+ $e_{12}P_X^{FC}$ + $e_{13}P_M$ + e_{14} I + e_{15} C+ e_{16} Y + e_{17}HL + e_{18}W + e_{19} P_{Equity} + e_{10}P+e_{14} (14)

4.4 Data

Keeping our research goals and particular model in mind, we will take data of the developing economies of the world in year 2005 and 2015 (cross sectional data).time series data of developing countries is not available of the variables involved due to which data of all the developing countries which is available is taken. The data is taken from WDI 2017 and IFS browser online data base. Countries in year 2005 are Albania,Argentina,Armenia,Azerbaijan,Bangladesh,Belarus,Bolivia,Botswana,Brazil, Chile, China, Colombia, Comoros, Congo, Dem. Rep., Congo, Rep., Costa Rica, Croatia, Czech Republic, Egypt, Arab Rep., El Salvador, Estonia, Gabon, Gambia, Georgia,Ghana,Honduras,Hungary,India,Indonesia,Jamaica,Kazakhstan,Kenya,Kyrgyz Republic,Liberia,Lithuania,Madagascar,Malaysia,Malta,Mongolia,Namibia,Nicaragua, Pakistan,Panama,Paraguay,Peru,Philippines,Poland,Romania,Russian Federation, Rwanda, South Africa, Sri Lanka, Tajikistan, Thailand, Turkey, Uganda, Ukraine

Uruguay, Vanuatu, Venezuela, Zambia while in 2015 are Albania,Argentina,Armenia,Bangladesh,Belarus,Bolivia,BosniaandHerzegovina,Botswana, Brazil, Chile, China, Colombia, Congo, Dem. Rep., Congo, Rep., Costa Rica, Cote d'Ivoire,Croatia,CzechRepublic,Ecuador,Egypt,ArabRep.,ElSalvador,Estonia,Ethiopia,Georgia,Ghana,Honduras,Hungary,Indonesia,Jamaica,Kazakhstan,Kenya,KyrgyzRepublic,Liberia,Lithuania,Malaysia,Malta,Mongolia,Namibia,Pakistan,Panama,Paraguay,Peru,Philippines,Poland,Romania,RussianFederation,Rwanda,Sri Lanka,Tajikistan,Thailand,Turkey,Uganda,Ukraine,Uruguay,Vietnam,West Bank and Gaza, Zambia. Most of the countries are same in both years while some are missing in 2015 because of unavailability of data. We choose year 2005 and 2015 because we want to compare the results of ten year difference of same data as the time series data is not available of all the variables involved in our model.

CHAPTER 5

EMPIRICAL RESULTS

In this section, we explore inflation, income inequality, poverty headcount ratio and unemployment determinants using cross-sectional complete data from 61 developing countries in 2005 and 57 developing countries in 2015 respectively of 15 variables discussed in section 4. Data of some variables which are HL (household long term assets) and share price equity are excluded due to unavailability. As a first step summary of descriptive statistics for selected indicators is described and then we shall compute structural equation modeling using Amos software.

5. 1a Descriptive Statistics

The following section presents a descriptive overview of the variables involved in this research of cross-sectional data of year 2005. These variables are mentioned in Eq 1-14 in section 4.4. Table 5.1a presents assessment of normality of the variables.

Table 5.2a: Assessment of normality (2005)

Variable	Min	max	skew	c.r.	kurtosis	c.r.
M	.014	29.845	1.188	3.787	1.399	2.230
i	-4.936	22.314	1.418	4.520	3.935	6.273
Y	8.597	12.359	.086	.273	-.468	-.746
P	.640	21.320	.850	2.711	.126	.201
W	3.287	21.567	.055	.175	-.621	-.991
E	-1.690	13.778	.339	1.080	-.647	-1.032
I	-9.038	.237	-6.761	-21.557	47.322	75.444
P_M	7.966	11.752	-.121	-.385	-.309	-.492
$P_X{}^{FC}$	7.158	11.842	-.400	-1.275	.091	.146
C_2	8.676	12.266	.073	.232	-.485	-.774
C_1	1.048	11.553	-3.583	-11.424	19.798	31.564
Π	.064	2.561	1.214	3.871	1.483	2.364
UEM	.088	2.384	1.028	3.279	.709	1.130
PHR	.000	9.850	.840	2.678	-.397	-.633
GI	2.660	6.480	.358	1.142	-.658	-1.049

The table shows that money supply (M), interest rate (i), investment (I), C_1 (general government final consumption) and π (inflation) show significant skewness and kurtosis at 0.05 level and the remaining variables ,we can say are normal.

5.2a Results of Structural Equation Modeling (SEM)

As a second step, the previously established equations scheme is evaluated using SEM. Standardized coefficients give us the concept of the relative effect on the dependent variables of the independent variables.

5.2.1a Selected Intermediate Variables

The unstandardized coefficients and standardized coefficients [1]of estimation equation (1) to (10) are given below in table 5.2.1a and table 5.2.2a respectively.

As we can see that the p value is far above 0.05 level in many cases, we will adjust it in the later section by setting the coefficient parameter as zero of highly insignificant independent variables.

Equations 1-9 presents the estimation of intermediate variables depending on input variables without observing significant and insignificant level.

$$E = 0.127\, i - 0.106\, M + e_1 \quad (1)$$

$$P_X^{FC} = -0.311\, i + 0.082 M + e_2 \quad (2)$$

Equation (1) shows that foreign currency value of domestic currency (E) has a positive relation with the interest rate and negative relation with money supply, similarly equation (2) shows that foreign currency value of price of exports has negative relation with interest rate and positive with money supply.

$$P_M = -0.306\, i + 0.006\, M + e_3 \quad (3)$$

[1] Standardized coefficients are easier to interpret and results are not affected by the units of the data as compare to unstandardized coefficients. In unstandardized coefficients, results change significantly as we change the units of the same data.

Table 5.2.1a: Unstandardized Regression Weights (2005)

Variables		Variables	Estimate	S.E.	C.R	P
i	→	C1	-.024	.041	-.583	.560
M	→	C1	.018	.030	.608	.543
i	→	C2	-.034	.023	-1.45	.148
i	→	P_X^{FC}	-.065	.026	-2.49	.013
i	→	P_M	-.054	.022	-2.42	.016
i	→	I	.016	.034	.473	.636
i	→	E	.101	.104	.973	.331
i	→	W	.847	.189	4.49	***
i	→	P	-.209	.131	-1.59	.111
M	→	C2	.004	.017	.239	.811
M	→	P_M	.001	.016	.047	.962
M	→	I	.009	.025	.351	.726
M	→	E	-.062	.076	-.810	.418
M	→	W	.584	.095	6.16	***
M	→	P	.200	.096	2.09	.037
M	→	Y	.003	.017	.158	.875
M	→	P_X^{FC}	.013	.019	.658	.511
C1	→	GI	-.112	.071	-1.58	.114
C2	→	GI	.150	.122	1.22	.219
P_X^{FC}	→	GI	.699	.106	6.58	***
P_M	→	GI	-2.68	.126	-21.3	***
I	→	GI	.212	.085	2.50	.012
E	→	GI	-.042	.027	-1.53	.125
W	→	GI	.117	.011	10.5	***
P	→	GI	.008	.021	.360	.719
C1	→	PHR	-1.63	.196	-8.31	***
C2	→	PHR	5.12	.338	15.2	***
P_X^{FC}	→	PHR	-.276	.294	-.939	.348
P_M	→	PHR	-3.66	.349	-10.5	***
I	→	PHR	1.50	.234	6.42	***
E	→	PHR	.138	.076	1.80	.071
W	→	PHR	-.034	.031	-1.10	.271
P	→	UEM	-.010	.012	-.816	.415
P	→	Π	.073	.009	8.46	***
W	→	Π	-.002	.005	-.480	.632
E	→	Π	-.005	.011	-.482	.629
I	→	Π	.283	.035	8.10	***
P_M	→	Π	-.063	.052	-1.21	.227
P_X^{FC}	→	Π	-.007	.044	-.163	.870
C2	→	Π	.976	.050	19.4	***

Variables		Variables	Estimate	S.E.	C.R	P
C1	→	Π	-.215	.029	-7.35	***
W	→	UEM	-.018	.007	-2.68	.007
E	→	UEM	-.029	.016	-1.75	.080
I	→	UEM	-.142	.050	-2.84	.005
P_M	→	UEM	-.899	.075	-12.1	***
$P_X{}^{FC}$	→	UEM	.204	.063	3.24	.001
C2	→	UEM	-1.27	.072	-17.6	***
C1	→	UEM	.168	.042	3.99	***
Y	→	GI	1.49	.120	12.4	***
Y	→	PHR	.149	.331	.452	.652
Y	→	UEM	1.67	.071	23.6	***
Y	→	Π	-.571	.049	-11.6	***
P	→	PHR	.094	.058	1.64	.102

Table 5.2.2a: Standardized Regression Weights (2005)

Variables		variables	Estimate
i	→	C_1	-.077
M	→	C_1	.080
i	→	C_2	-.189
i	→	$P_X{}^{FC}$	-.311
i	→	P_M	-.306
i	→	I	.063
i	→	E	.127
i	→	W	.432
i	→	P	-.198
M	→	C_2	.031
M	→	P_M	.006
M	→	I	.047
M	→	E	-.106
M	→	W	.407
M	→	P	.259
i	→	Y	-.234
M	→	Y	.020
M	→	$P_X{}^{FC}$	.082
C_1	→	GI	-.056
C_2	→	GI	.043
$P_X{}^{FC}$	→	GI	.235
P_M	→	GI	-.757
I	→	GI	.088
E	→	GI	-.054

Variables		variables	Estimate
W	→	GI	.371
P	→	GI	.013
C_1	→	PHR	-.370
C_2	→	PHR	.680
$P_X{}^{FC}$	→	PHR	-.043
P_M	→	PHR	-.475
I	→	PHR	.286
E	→	PHR	.081
W	→	PHR	-.049
P	→	UEM	-.025
P	→	Π	.314
W	→	Π	-.018
E	→	Π	-.018
I	→	Π	.297
P_M	→	Π	-.045
$P_X{}^{FC}$	→	Π	-.006
C_2	→	Π	.714
C_1	→	Π	-.269
W	→	Π	-.082
E	→	Π	-.054
I	→	Π	-.086
P_M	→	Π	-.372
$P_X{}^{FC}$	→	Π	.100
C_2	→	UEM	-.541
C_1	→	UEM	.122
Y	→	GI	.442
Y	→	PHR	.020
Y	→	UEM	.727
Y	→	Π	-.427
P	→	PHR	.074

$$I = 0.063\, i + 0.047M + e_4 \qquad (4)$$

Equation (3) shows that foreign currency value of price of imports (P_M) has a negative relation with the interest rate and positive relation with money supply, similarly equation (4) shows that foreign direct investment(I) has positive relation with interest rate and positive with money supply.

$$C_1 = -0.077\, i + 0.080\, M + e_5 \qquad (5)$$

$$Y = -0.234\ i + 0.020\ M + e_6 \quad (6)$$

Equation (5) shows that General government final consumption expenditure (c_1)has a negative relation with the interest rate and positive relation with money supply. Similarly equation (6) shows that gdp(Y) has negative relation with interest rate and positive with money supply.

$$P = -0.198\ i + 0.259\ M + e_7 \quad (7)$$

$$W = 0.432\ i + 0.407\ M + e_8 \quad (8)$$

Equation (7) shows that consumer price index (P) has a negative relation with the interest rate and positive relation with money supply. Similarly equation (8) shows that total wealth (W) has positive relation with interest rate and money supply.

$$C_2 = -0.189i + 0.031\ M + e_9 \quad (9)$$

Equation (9) shows that final consumption expenditure (C_2) has a negative relation with the interest rate and positive relation with money supply.

5.2.2a Output Variables

Finally, the standardized coefficients of estimation equation of output variables are given below:

$$\pi = -0.018E - 0.006P_{X^{FC}} - 0.045P_M + 0.297\ I - 0.269\ C_1 - 0.427\ Y + 0.018W + 0.314\ P + 0.714C_2 + e_{10} \quad (10)$$

equation (10) shows that E, $P_{X^{FC}}$,P_M , C_1, Y has negative relation with inflation(π) implying they are inversely proportional and I, W, P and C_2 has positive relation with inflation (π) implying they are directly proportional.

$$UEM = -0.054E + 0.100P - 0.372 - 0.086\ I + 0.122\ C_1 + 0.727\ Y - 0.082W - 0.025\ P - 0.541C_2 + e_{11} \quad (11)$$

equation (11) shows that E, P_M, I, P, C_2 have negative relation with unemployment (UEM) implying they are inversely proportional and $P_X{}^{FC}$, C_1 ,Y,W have positive relation with unemployment (UEM) implying they are directly proportional.

PHR=0.081E − 0.043$P_X{}^{FC}$ + 0.475P_M + 0.286 I −0.370C_1+ 0.020 Y − 0.040W + 0.074P+ 0. 680C_2 + e_{12} (12)

equation (12) shows that E, P_M, I, Y, P, C_2 have positive relation with poverty headcount ratio (PHR) implying they are directly proportional and $P_X{}^{FC}$, C_1 ,W have negative relation with poverty headcount ratio (PHR) implying they are inversely proportional.

GI=−.054E+0.235$P_X{}^{FC}$ − 0.757P_M + 0.088I −0.056C_1+ 0.020 Y + 0.371W + 0.013P+ 0.043C_2+e_{13} (13)

equation (13) shows that E, P_M, C_1 have negative relation with Gini coefficient (GI) implying they are inversely proportional and $P_X{}^{FC}, I, Y, W, P, C_2$ have positive relation with Gini coefficient (GI) implying they are directly proportional.

5.2.3a Significant Results of Intermediate Variables

The unstandardized and standardized coefficients of estimation equation (1) to (9) are given below in table 5.2.3a and table 5.2.4a respectively after setting the regression weight equal to zero whose p-value is highly insignificant i.e. above 0.50 level. Final selection will be at .05 level or .10 level. During reduction, we improve our significant level and hence our accuracy. Following are the results with significant and insignificant impact of interest rate and money supply on the intermediate variables.

Estimation of equation 1-9 show that there is no significant impact of money supply on $P_X{}^{FC}$, I, C_1, Y and C_2 while interest rate has no significant impact on I, C_1 .

E= 0.127 i −0.106 M+ e_1 (1)

$$P_X^{FC} = -0.311\ i + .0M + e_2 \quad (2)$$

Equation (1) shows that foreign currency value of domestic currency (E) has a positive relation with the interest rate and negative relation with money supply, similarly equation (2) shows that foreign currency value of price of exports has negative relation with interest rate and zero with money supply. Estimates of (1) and (2) show that One SD change in interest, and money supply increase the foreign currency value of domestic currency (E) by 0.127 and decrease it by -0.106 respectively and similarly foreign currency value of price of exports decreases by -0.311 and by 0 respectively. However, impact of equation (1) is not significant whereas of equation (2) is highly significant.

$$P_M = -0.307\ i + .0\ M + e_3 \quad (3)$$

$$I = .0\ i + .0M + e_4 \quad (4)$$

Equation (3) shows that foreign currency value of price of imports (P_M) has a negative relation with the interest rate and zero relation with money supply. Similarly, equation (4) shows that foreign direct investment (I) has zero relation with interest rate and zero with money supply. Estimates of (3) show that One SD change in interest decrease the foreign currency value of price of imports (P_M) by -0. 307. The impact is highly significant.

$$C_1 = 0\ i + .0\ M + e_5 \quad (5)$$

$$Y = -0.239\ i + .0\ M + e_6 \quad (6)$$

Equation (5) shows that General government final consumption expenditure (C_1)has a

zero relation with the interest rate and zero relation with money supply, similarly equation (6) shows that GDP (Y) has negative relation with interest rate and zero with money supply. Estimates of (6) show that One SD change in interest affects GDP (Y) decreases by -0.234 and these results are highly significant.

$P = -0.198\ i + 0.259\ M + e_7$ (7)

$W = 0.432\ i + 0.407\ M + e_8$ (8)

Equation (7) shows that consumer price index (P) has a negative relation with the interest rate and positive relation with money supply. Similarly, equation (8) shows that total wealth (W) has positive relation with interest rate and money supply. Estimates of (7) and (8) show that One SD change in interest and money supply decrease the consumer price index (P) by -0.198 and increase it by 0.259 respectively and similarly total wealth (W) increases by 0.432 and 0.407 respectively. Results are highly significant.

$C_2 = -0.196i + .0\ M + e_9$ (9)

Equation (9) shows that final consumption expenditure (C_2) has a negative relation with the interest rate and zero relation with money supply. Estimates of (9) shows that One

Table 5.2.3a: Unstandardized Regression Weights: (2005)

Variables		Variables	Estimate	S.E.	C.R.	P
I	→	C_1	.000			
M	→	C_1	.000			
I	→	C_2	-.035	.023	-1.552	.121
I	→	$P_X{}^{FC}$	-.069	.025	-2.721	.007
I	→	P_M	-.054	.022	-2.503	.012
I	→	I	.000			
I	→	E	.101	.104	.973	.331
I	→	W	.847	.189	4.491	***
I	→	P	-.209	.131	-1.593	.111
M	→	C_2	.000			
M	→	P_M	.000			
M	→	I	.000			
M	→	E	-.062	.076	-.810	.418
M	→	W	.584	.095	6.164	***
M	→	P	.200	.096	2.087	.037
I	→	Y	-.044	.023	-1.906	.057

Variables		Variables	Estimate	S.E.	C.R.	P
M	→	Y	.000			
M	→	$P_X{}^{FC}$	.000			
C_1	→	GI	-.130	.071	-1.838	.066
C_2	→	GI	.226	.122	1.852	.064
$P_X{}^{FC}$	→	GI	.736	.106	6.943	***
P_M	→	GI	-2.723	.126	-21.638	***
I	→	GI	.237	.085	2.806	.005
E	→	GI	-.042	.027	-1.526	.127
W	→	GI	.117	.011	10.354	***
P	→	GI	.000			
C_1	→	PHR	-1.622	.196	-8.294	***
C_2	→	PHR	5.231	.337	15.500	***
$P_X{}^{FC}$	→	PHR	-.253	.293	-.864	.388
P_M	→	PHR	-3.654	.348	-10.495	***
I	→	PHR	1.493	.234	6.387	***
E	→	PHR	.138	.076	1.819	.069
W	→	PHR	-.034	.031	-1.087	.277
P	→	UEM	-.010	.012	-.818	.413
P	→	Π	.073	.009	8.524	***
W	→	Π	.000			
E	→	Π	.000			
I	→	Π	.273	.035	7.800	***
P_M	→	Π	-.042	.052	-.806	.420
$P_X{}^{FC}$	→	Π	.000			
C_2	→	Π	.990	.050	19.675	***
C_1	→	Π	-.206	.029	-7.046	***
W	→	UEM	-.018	.007	-2.667	.008
E	→	UEM	-.029	.016	-1.753	.080
I	→	UEM	-.142	.050	-2.841	.004
P_M	→	UEM	-.899	.075	-12.029	***
$P_X{}^{FC}$	→	UEM	.204	.063	3.241	.001
C_2	→	UEM	-1.279	.072	-17.659	***
C_1	→	UEM	.168	.042	4.007	***
Y	→	GI	1.443	.120	12.066	***
Y	→	PHR	.000			
Y	→	UEM	1.678	.071	23.645	***
Y	→	Π	-.622	.049	-12.640	***
P	→	PHR	.094	.058	1.634	.102

Table 5.2.4a: Standardized Regression Weights: (2005)

Variables		Variables	Estimate
i	→	C_1	.000
M	→	C_1	.000
i	→	C_2	-.196
i	→	$P_X{}^{FC}$	-.331
i	→	P_M	-.307
i	→	I	.000
i	→	E	.127
i	→	W	.432
i	→	P	-.198
M	→	C_2	.000
M	→	P_M	.000
M	→	I	.000
M	→	E	-.106
M	→	W	.407
M	→	P	.259
i	→	Y	-.239
M	→	Y	.000
M	→	$P_X{}^{FC}$	.000
C_1	→	GI	-.064
C_2	→	GI	.065
$P_X{}^{FC}$	→	GI	.247
P_M	→	GI	-.768
I	→	GI	.098
E	→	GI	-.054
W	→	GI	.368
P	→	GI	.000
C_1	→	PHR	-.366
C_2	→	PHR	.688
$P_X{}^{FC}$	→	PHR	-.039
P_M	→	PHR	-.470
I	→	PHR	.282
E	→	PHR	.081
W	→	PHR	-.049
P	→	UEM	-.025
P	→	Π	.308
W	→	Π	.000
E	→	Π	.000
I	→	Π	.280
P_M	→	Π	-.029
$P_X{}^{FC}$	→	Π	.000

Variables		Variables	Estimate
C_2	→	Π	.709
C_1	→	Π	-.253
W	→	UEM	-.082
E	→	UEM	-.054
I	→	UEM	-.086
P_M	→	UEM	-.372
$P_X{}^{FC}$	→	UEM	.100
C_2	→	UEM	-.541
C_1	→	UEM	.122
Y	→	GI	.426
Y	→	PHR	.000
Y	→	UEM	.726
Y	→	Π	-.456
P	→	PHR	.073

SD change in interest decrease consumption expenditure (C_2) by -0.196.Results are highly significant.

5.2.4a Significant Results of Output Variables

Finally, the standardized coefficients of estimation equation (10-13) of output variables after setting regression weight equal to 0 of their intermediate variables whose impact is highly insignificant. Given below are the equations derived by the above results in table 5.2.4a of intermediate variable on output variables.

$$\pi = 0.0\text{E}+0.0P_X - 0.029P_M + .280\,\text{I} - 0.253\,C_1 - 0.456\,\text{Y} + 0\text{W} + 0.308\,P + 0.709C_2 + e_{10} \quad (10)$$

equation (10) shows that P_M, C_1, Y have negative relation with inflation(π) implying they are inversely proportional and I, P and C_2 have positive relation with inflation(π) implying they are directly proportional. Estimates of (10) shows that One SD change in C_1 and Y decrease inflation (π) by -0.029,-0.253,-0.456

respectively and I, P and C_2 increase it by 0.280, 0.308, and 0.709 respectively. However, impact of I, P, C_2, C_1, Y are highly significant at 0.05 level.

UEM= −0.054E + 0.100P_X − 0.372P_M − 0.086 I + 0.122 C_1+ 0.726 Y − 0.082W − 0.025 P −0.541C_2+e_{11}. (11)

equation (11) shows that E, P_M,I, P, C_2 have negative relation with unemployment (UEM) implying they are inversely proportional and $P_{X^{FC}}$, C_1 ,Y,W have positive relation with unemployment (UEM) implying they are directly proportional. Estimates of (11) shows that One SD change in E, P_M,I, P, C_2, decrease unemployment (UEM) by -0.054,-0.372,-0.086,-0.025 and -0.541 respectively. Similarly C_1, Y, W increase it by 0.100,0.122,0.726 and 0.082 respectively. However, impact of I, W,C_2, C_1, Y, P_M and $P_{X^{FC}}$ are highly significant at .05 level.

PHR=0.081E− 0.039$P_{X^{FC}}$ − 0.470P_M + 0.282 I −0.366C_1+ .0 Y − 0.049W + 0.073P+ 0.688C_2+e_{12} (12)

equation (12) shows that E, P_M,I, P, C_2 have positive relation with poverty headcount ratio (PHR) implying they are directly proportional and $P_{X^{FC}}$,Pm, C_1 ,W have negative relation with poverty headcount ratio (PHR) implying they are inversely proportional. Estimates of (12) shows that One SD change in E,I, P, C_2 increase unemployment (UEM) by 0.081, 0.282, 0.073, 0.688 respectively. Similarly P,Pm, C_1, W decrease it by -0.039, -0.470, -0.366 and -0.049 respectively. However, impact of I, E,C_2, $C_1$and P_M are highly significant at .05 level.

GI=−0.054E+0.247$P_{X^{FC}}$ −0.768P_M + 0.098I −0.064C_1+ 0.426Y + 0.368W + .0P+ 0.065C_2 +e_{13} (13)

equation (13) shows that E, P_M , C_1 have negative relation with Gini coefficient (GI) implying they are inversely proportional and $P_{X^{FC}}$,I, Y, W, C_2 have positive relation with

Gini coefficient (GI) implying they are directly proportional. Estimates of (13) shows that One SD change in E, P_M, C_1 decrease Gini coefficient (GI)) by -0.054,-0.768,-0.064 respectively. Similarly $P_X{}^{FC}, I, Y, W, C_2$ increase it by 0.247, 0.098, 0.426, 0.368 and 0.065 respectively. However, impact of I, W,C_2, C_1, Y, P_M and $P_X{}^{FC}$ are highly significant at .05 level.

5. 1b Descriptive Statistics

The following section presents a descriptive overview of the variables involved in this research of cross-sectional data of year 2015 of 57 countries. These variables are mentioned in Eq 1-14 in section 4.4. The table 5.1b shows that interest rate (i), investment (I), consumer price index (P), inflation (π), unemployment (UEM) and poverty (PHR) show significant skewness and kurtosis at .05 level and the remaining variables, we can say are normal. Table 5.1b presents assessment of normality of the variables.

Table 5.1b: Assessment of normality (2015)

Variable	min	Max	skew	c.r.	kurtosis	c.r.
M	-1.171	3.957	.552	1.701	1.073	1.653
I	-1.228	3.383	.821	2.532	1.765	2.721
Y	9.502	13.044	.589	1.815	.110	.169
C_1	8.278	11.646	.228	.702	-.287	-.443
C_2	9.278	12.640	.430	1.325	-.286	-.441
P_M	8.452	12.331	.216	.667	-.188	-.290
$P_X{}^{FC}$	9.191	12.195	.513	1.582	-.123	-.190
I	-6.810	1.523	-4.157	-12.814	18.227	28.090
P	-.990	111.380	4.264	13.143	17.756	27.364
E	-1.120	16.610	.626	1.928	-.322	-.497
W	1.541	6.912	.141	.436	-.492	-.758
Π	-1.023	48.700	3.626	11.177	16.821	25.923
UEM	.049	2.769	1.567	4.828	2.396	3.693
PHR	.000	7.620	1.368	4.216	.720	1.110
GI	2.550	5.910	.338	1.043	-.411	-.633
Multivariate					92.916	15.532

5.2b Results of Structural Equation Modeling (SEM)

As a second step, system of equations developed earlier is analyzed by using SEM. Standardized coefficients provide us the idea about relative impact of the independent variables on the dependent variables.

5.2.1b Selected Intermediate Variables

The unstandardized coefficients and standardized coefficients of estimation equation (1) to (10) are given below in table 5.2.1b and table 5.2.2b respectively.

As we can see that the p value is far above .05 level, we will adjust it in the later section by setting the coefficient parameter as zero of highly insignificant independent variables.

Table 5.2.1b Unstandardized Regression Weights: (2015)

Variables		Variables	Estimate	S.E.	C.R.	P
i	→	Y	-.179	.125	-1.429	.153
i	→	C_1	-.260	.119	-2.177	.029
i	→	P_M	-.299	.135	-2.222	.026
i	→	$P_X{}^F$	-.249	.107	-2.336	.019
i	→	I	-.295	.215	-1.371	.170
i	→	P	-5.612	3.512	-1.598	.110
i	→	E	.998	.683	1.460	.144
i	→	W	.057	.224	.253	.800
M	→	Y	.098	.097	1.012	.312
M	→	C_1	.095	.093	1.023	.306
M	→	C_2	.142	.096	1.484	.138
M	→	P_M	.045	.104	.428	.669
M	→	$P_X{}^F$	.036	.083	.440	.660
M	→	I	.007	.167	.043	.965
M	→	P	2.048	2.725	.751	.452
M	→	E	-1.222	.530	-2.305	.021
M	→	E	-.101	.174	-.580	.562
i	→	C_2	-.222	.124	-1.793	.073
Y	→	Gini	.131	.118	1.109	.267
C_1	→	Gini	.159	.122	1.301	.193

Variables		Variables	Estimate	S.E.	C.R.	P
C_2	→	Gini	.356	.118	3.022	.003
P_M	→	Gini	.822	.108	7.588	***
$P_X{}^F$	→	Gini	-2.062	.136	-15.148	***
I	→	Gini	-.162	.069	-2.347	.019
P	→	Gini	-.005	.004	-1.158	.247
E	→	Gini	.001	.021	.067	.946
W	→	Gini	.292	.067	4.380	***
W	→	PHR	-.260	.219	-1.188	.235
E	→	PHR	.018	.069	.268	.789
P	→	PHR	-.017	.014	-1.225	.221
I	→	PHR	-.102	.226	-.452	.652
$P_X{}^F$	→	PHR	-4.050	.446	-9.075	***
P_M	→	PHR	2.850	.355	8.029	***
C_2	→	PHR	4.369	.387	11.304	***
C_1	→	PHR	-1.978	.400	-4.945	***
Y	→	PHR	-2.083	.387	-5.377	***
Y	→	UEM	-.155	.089	-1.740	.082
C_1	→	UEM	1.022	.092	11.118	***
C_2	→	UEM	-1.090	.089	-12.267	***
P_M	→	UEM	-1.153	.082	-14.126	***
$P_X{}^F$	→	UEM	1.386	.103	13.509	***
I	→	UEM	-.138	.052	-2.658	.008
P	→	UEM	.008	.003	2.415	.016
E	→	UEM	.008	.016	.518	.604
W	→	UEM	-.040	.050	-.788	.431
W	→	Π	-2.109	.693	-3.043	.002
E	→	Π	-.230	.218	-1.056	.291
P	→	Π	.053	.044	1.204	.229
I	→	Π	.375	.716	.523	.601
$P_X{}^F$	→	Π	-15.365	1.413	-10.874	***
P_M	→	Π	4.706	1.124	4.186	***
C_2	→	Π	6.881	1.224	5.623	***
C_1	→	Π	-.492	1.266	-.388	.698
Y	→	Π	4.963	1.227	4.046	***

Table 5.2.2b: Standardized Regression Weights

Variables		Variables	Estimate
I	→	Y	-.187
I	→	C_1	-.279
I	→	P_M	-.285
I	→	$P_{X^{FC}}$	-.299
I	→	I	-.181
i	→	P	-.209
i	→	E	.185
i	→	W	.034
M	→	Y	.132
M	→	C_1	.131
M	→	C_2	.191
M	→	P_M	.055
M	→	$P_{X^{FC}}$	.056
M	→	I	.006
M	→	P	.098
M	→	E	-.291
M	→	W	-.077
i	→	C_2	-.230
Y	→	GI	.059
C_1	→	GI	.069
C_2	→	GI	.160
P_M	→	GI	.402
$P_{X^{FC}}$	→	GI	-.803
I	→	GI	-.123
P	→	GI	-.061
E	→	GI	.004
W	→	GI	.229
W	→	PHR	-.062
E	→	PHR	.014
P	→	PHR	-.064
I	→	PHR	-.024
$P_{X^{FC}}$	→	PHR	-.479
P_M	→	PHR	.423
C_2	→	PHR	.596
C_1	→	PHR	-.261
Y	→	PHR	-.282
Y	→	UEM	-.067
C_1	→	UEM	.430
C_2	→	UEM	-.473
P_M	→	UEM	-.545

Variables		Variables	Estimate
$P_X{}^{FC}$	→	UEM	.521
I	→	UEM	-.102
P	→	UEM	.093
E	→	UEM	.020
W	→	UEM	-.030
W	→	Π	-.195
E	→	Π	-.068
P	→	Π	.078
I	→	Π	.034
$P_X{}^{FC}$	→	Π	-.705
P_M	→	Π	.271
C_2	→	Π	.365
C_1	→	Π	-.025
Y	→	π	.261

Equations 1 -9 presents the estimation of intermediate variables depending on input variables without observing significant and insignificant level.

$$E = 0.127\, i - 0.106\, M + e_1 \quad (1)$$

$$P_X{}^{FC} = -0.311\, i + 0.082 M + e_2 \quad (2)$$

Equation (1) shows that foreign currency value of domestic currency (E) has a positive relation with the interest rate and negative relation with money supply. Similarly Equation (2) shows that foreign currency value of price of exports has negative relation with interest rate and positive with money supply.

$$P_M = -0.306\, i + 0.006\, M + e_3 \quad (3)$$

$$I = 0.063\, i + 0.047 M + e_4 \quad (4)$$

Equation (3) shows that foreign currency value of price of imports (P_M) has a negative relation with the interest rate and positive relation with money supply. Similarly equation (4) shows that foreign direct investment (I) has positive relation with interest rate and positive with money supply.

$$C_1 = -0.077\, i + 0.080\, M + e_5 \quad (5)$$

$$Y = -0.234\ i + 0.020\ M + e_6 \quad (6)$$

Equation (5) shows that General government final consumption expenditure (C_1) has a negative relation with the interest rate and positive relation with money supply. Similarly, equation (6) shows that GDP (Y) has negative relation with interest rate and positive with money supply.

$$P = -0.198\ i + 0.259\ M + e_7 \quad (7)$$

$$W = 0.432\ i + 0.407\ M + e_8 \quad (8)$$

Equation (7) shows that consumer price index (P) has a negative relation with the interest rate and positive relation with money supply. Similarly, equation (8) shows that total wealth (W) has positive relation with interest rate and money supply.

$$C_2 = -0.189i + 0.031\ M + e_9 \quad (9)$$

Equation (9) shows that final consumption expenditure (C_2) has a negative relation with the interest rate and positive relation with money supply.

5.2.2(b) Output Variables

Finally, the standardized coefficients of estimation equation of output variables are given below:

$$\pi = -0.018E - 0.006P_{X^{FC}} - 0.045P_M + 0.297\ I - 0.269\ C_1 - 0.427\ Y - 0.018W + 0.314P + 0.714C_2 + e_{10} \quad (10)$$

Equation (10) shows that E, $P_{X^{FC}}$, C_1, Y has negative relation with inflation(π) implying they are inversely proportional and I, W, P and C_2 has positive relation with inflation(π) implying they are directly propotional.

$$UEM = -0.054E + 0.100P_{X^{FC}} - 0.372P_M - 0.086\ I + 0.122\ C_1 + 0.727\ Y + 0.082W - 0.025P - 0.541C_2 + e_{11} \quad (11)$$

equation (11) shows that E, P_M, I, P, C_2 have negative relation with unemployment (UEM) implying they are inversely proportional and $P_{X^{FC}}$, C_1 ,Y,W have positive relation with unemployment (UEM) implying they are directly proportional.

$$PHR=0.081E - 0.043P_{X^{FC}} + 0.475P_M + 0.286\ I - 0.370C_1 + 0.020\ Y - 0.040W + 0.074P + 0.680C_2 + e_{12} \quad (12)$$

equation (12) shows that E, P_M, I, Y, P, C_2 have positive relation with poverty headcount ratio (PHR) implying they are directly proportional and $P_{X^{FC}}$, C_1 and W have negative relation with poverty headcount ratio (PHR) implying they are inversely proportional.

$$GI=-0.054E + 0.235P_{X^{FC}} - 0.757P_M + 0.088I - 0.056C_1 + 0.020\ Y + 0.371W + 0.013P + 0.043C_2 + e_{13} \quad (13)$$

Equation (13) shows that E, P_M, C_1 have negative relation with Gini coefficient (GI) implying they are inversely proportional and $P_{X^{FC}}, I, Y, W, P$ and C_2 and have positive relation with Gini coefficient (GI) implying they are directly proportional.

5.2.3(b) Results of Intermediate Variables

The unstandardized and standardized coefficients of estimation equation (1) to (9) are given in table 5.2.3b and table 5.2.4b respectively after setting the regression weight equal to zero whose p-value is highly insignificant i.e. above .50 level. Following are the results with significant and insignificant impact of interest rate and money supply on the intermediate variables.

As we can see that the p value is far above .05 level , we will adjust it in the later section by setting the coefficient parameter as zero of highly insignificant independent variables.

Equations 1 -9 presents the estimation of intermediate variables depending on input variables without observing significant and insignificant level.

$$E = 0.185\, i - 0.291\, M + e_1 \quad (1)$$

$$P_X^{FC} = -0.299\, i + 0.056 M + e_2 \quad (2)$$

Equation (1) shows that foreign currency value of domestic currency (E) has a positive relation with the interest rate and negative relation with money supply. Similarly, equation (2) shows that foreign currency value of price of exports has negative relation with interest rate and positive with money supply.

$$P_M = -0.285\, i + 0.055\, M + e_3 \quad (3)$$

$$I = -0.181\, i + 0.006 M + e_4 \quad (4)$$

Equation (3) shows that foreign currency value of price of imports (P_M) has a negative relation with the interest rate and positive relation with money supply. Similarly equation (4) shows that foreign direct investment (I) has negative relation with interest rate and positive with money supply.

$$C_1 = -0.279\, i + 0.131\, M + e_5 \quad (5)$$

$$Y = -0.187\, i + 0.132\, M + e_6 \quad (6)$$

Equation (5) shows that General government final consumption expenditure (C_1)has a negative relation with the interest rate and positive relation with money supply. Similarly, equation (6) shows that GDP (Y) has negative relation with interest rate and positive with money supply.

$$P = -0.209\, i + 0.098\, M + e_7 \quad (7)$$

$$W = 0.034 i - 0.077 M + e_8 \quad (8)$$

Equation (7) shows that consumer price index (P) has a negative relation with the interest rate and positive relation with money supply. Similarly, equation (8) shows that total wealth (W) has positive relation with interest rate and negative with money supply.

$C_2 = -0.230\text{i} + 0.191\ \text{M} + e_9$ (9)

Equation (9) shows that final consumption expenditure (C_2) has a negative relation with the interest rate and positive relation with money supply.

5.2.2(b) Output variables

Finally, the standardized coefficients of estimation equation of output variables are given below:

$\pi = -0.068\text{E} - 0.705P_{X^{FC}} + 0.271P_M + 0.034\ \text{I} - 0.025\ C_1 + .261\ \text{Y} - 0.195\text{W} + 0.078\ P + 0.365C_2 + e_{10}$ (10)

equation (10) shows that E, $P_{X^{FC}}$, C_1 has negative relation with inflation(π) implying they are inversely proportional and I, W, P and C_2 has positive relation with inflation(π) implying they are directly propotional.

$\text{UEM} = 0.020\text{E} + 0.521P_{X^{FC}} - 0.545P_M - 0.102\ \text{I} + 0.430\ C_1 - 0.067\ \text{Y} - 0.030\text{W} + 0.093P - 0.473C_2 + e_{11}$ (11)

equation (11) shows that P_M, I, C_2 and Y have negative relation with unemployment (UEM) implying they are inversely proportional and $P_{X^{FC}}$, C_1, W, E and P have positive relation with unemployment (UEM) implying they are directly proportional.

$\text{PHR} = 0.014\text{E} - 0.479P_{X^{FC}} + 0.423P_M - 0.024\ \text{I} - 0.261C_1 - 0.282\ \text{Y} - 0.062\text{W} - 0.064P + 0.596C_2 + e_{12}$ (12)

equation (12) shows that E, P_M, C_2 have positive relation with poverty headcount ratio (PHR) implying they are directly proportional and $P_{X^{FC}}$, C_1, W, I and P have negative relation with poverty headcount ratio (PHR) implying they are inversely proportional.

$$GI=0.004E-0.803P_X^{FC}+0.403P_M-0.123I+0.069C_1+0.059\,Y+0.229W-0.061P+0.160C_2+e_{13} \quad (13)$$

equation (13) shows that E, $P_{M,}$, C_1 ,Y,W and C_2 have positive relation with Gini coefficient (GI) implying they are directly proportional and $P_X{}^{FC}$,I, P have negative relation with Gini coefficient (GI) implying they are inversely proportional.

5.2.3b Significant results of intermediate variables

The unstandardized and standardized coefficients of estimation equation (1) to (9) are given in table 5.2.3b and table 5.2.4b respectively after setting the regression weight equal to zero whose p-value is highly insignificant i.e. above .50 level. Final selection will be at .05 level or .10 level. During reduction, we improve our significant level and hence our accuracy. Following are the results with significant and insignificant impact of interest rate and money supply on the intermediate variables.

Estimation of equation 1-9 show that there is a significant impact of money supply on E while interest rate has a significant impact on C_1, C_2, $P_X{}^{FC}$ and P_M at .05 level. The impact of interest rate and money supply on other intermediate variables are not significant at .05 level.

$$E=0.185\,i-0.291\,M+e_1 \quad (1)$$

$$P_X{}^{FC}=-0.294\,i+0M+e_2 \quad (2)$$

Equation (1) shows that foreign currency value of domestic currency (E) has a positive relation with the interest rate and negative relation with money supply. Similarly, equation (2) shows that foreign currency value of price of exports has negative relation with interest rate and zero with money supply. Estimates of (1) and (2) show that One SD change in interest, and money supply increase the foreign currency value of domestic currency (E)

by 0.185 and decrease it by -0.291 respectively and similarly foreign currency value of price of exports decreases by -0.294 and by 0 respectively. However, impact of equation (1) is not significant whereas of equation (2) is highly significant at .05 level.

P_M= −0.281 i + 0 M + e 3 (3)

I =−0.180 i + 0M + e 4 (4)

Equation (3) shows that foreign currency value of price of imports (P_M) has a negative relation with the interest rate and zero relation with money supply. Similarly, equation (4) shows that foreign direct investment (I) has negative relation with interest rate and zero with money supply. Estimates of (3) show that One SD change in interest decrease the foreign currency value of price of imports (P_M) by -0.281.This impact is highly significant.

C_2= -0.279 i + 0.131 M + e 5 (5)

Y = -0.187 i + 0.132M + e 6 (6)

Equation (5) shows that General government final consumption expenditure (C_1) has a negative relation with the interest rate (highly significant) and positive relation with money supply (insignificant). Similarly equation (6) shows that gdp (Y) has negative relation with interest rate and positive with money supply. Estimates of (6) show that One SD change in interest effects GDP(Y) decreases by -0.187 and One SD change in money supply effects GDP(Y) and increase it by 0.132 .These results are not significant.

P = −0.209 i + 0.098 M + e 7 (7)

W= 0 i + 0 M + e (8)

Equation (7) shows that consumer price index (P) has a negative relation with the interest rate and positive relation with money supply. Similarly equation (8) shows that total wealth (W) has zero relation with interest rate and money supply. Estimates of (7) show that One SD change in interest, and money supply decrease the consumer price

Table 5.2.3b: Regression Weights (unstandardized)

Variables		Variables	Estimate	S.E.	C.R.	P
i	→	Y	-.179	.125	-1.429	.153
i	→	C_1	-.260	.119	-2.177	.029
i	→	P_M	-.294	.134	-2.191	.028
i	→	$P_{X^{FC}}$	-.246	.107	-2.304	.021
i	→	I	-.294	.215	-1.372	.170
i	→	P	-5.612	3.512	-1.598	.110
i	→	E	.998	.683	1.460	.144
i	→	W	.000			
M	→	Y	.098	.097	1.012	.312
M	→	C_1	.095	.093	1.023	.306
M	→	C_2	.142	.096	1.484	.138
M	→	P_M	.000			
M	→	$P_{X^{FC}}$	.000			
M	→	I	.000			
M	→	P	2.048	2.725	.751	.452
M	→	E	-1.222	.530	-2.305	.021
M	→	W	.000			
i	→	C_2	-.222	.124	-1.793	.073
Y	→	GI	.137	.118	1.164	.244
C_1	→	GI	.154	.122	1.264	.206
C_2	→	GI	.360	.117	3.067	.002
P_M	→	GI	.828	.108	7.661	***
$P_{X^{FC}}$	→	GI	-2.075	.136	-15.286	***
I	→	GI	-.161	.069	-2.329	.020
P	→	GI	-.005	.004	-1.168	.243
E	→	GI	.000			
W	→	GI	.292	.067	4.381	***
W	→	PHR	-.262	.219	-1.198	.231
E	→	PHR	.000			
P	→	PHR	-.017	.014	-1.260	.208
I	→	PHR	-.086	.226	-.379	.705
$P_{X^{FC}}$	→	PHR	-4.224	.445	-9.484	***

Variables		Variables	Estimate	S.E.	C.R.	P
P_M	→	PHR	2.927	.354	8.261	***
C_2	→	PHR	4.421	.385	11.473	***
C_1	→	PHR	-2.042	.399	-5.116	***
Y	→	PHR	-2.001	.387	-5.173	***
Y	→	UEM	-.126	.089	-1.407	.159
C_1	→	UEM	1.033	.092	11.191	***
C_2	→	UEM	-1.114	.089	-12.504	***
P_M	→	UEM	-1.156	.082	-14.109	***
$P_{X^{FC}}$	→	UEM	1.353	.103	13.135	***
I	→	UEM	-.127	.052	-2.417	.016
P	→	UEM	.008	.003	2.415	.016
E	→	UEM	.000			
W	→	UEM	.000			
W	→	Π	-2.139	.693	-3.084	.002
E	→	Π	-.211	.217	-.972	.331
P	→	Π	.053	.044	1.218	.223
I	→	Π	.000			
$P_{X^{FC}}$	→	Π	-15.370	1.408	-10.917	***
P_M	→	Π	4.813	1.120	4.295	***
C_2	→	Π	6.486	1.221	5.310	***
C_1	→	Π	.000			
Y	→	π	4.489	1.226	3.661	***

Table 5.2.4b: Standardized Regression Weights

Variables		Variables	Estimate
I	→	Y	-.187
I	→	C_1	-.279
I	→	P_M	-.281
I	→	$P_{X^{FC}}$	-.294
I	→	I	-.180
I	→	P	-.209
I	→	E	.185
I	→	W	.000
M	→	Y	.132
M	→	C_1	.131
M	→	C_2	.191
M	→	P_M	.000
M	→	$P_{X^{FC}}$	.000
M	→	I	.000
M	→	P	.098
M	→	E	-.291

Variables		Variables	Estimate
M	→	W	.000
I	→	C_2	-.230
Y	→	GI	.061
C_1	→	GI	.066
C_2	→	GI	.161
P_M	→	GI	.402
$P_X{}^{FC}$	→	GI	-.803
I	→	GI	-.122
P	→	GI	-.061
E	→	GI	.000
W	→	GI	.228
W	→	PHR	-.061
E	→	PHR	.000
P	→	PHR	-.065
I	→	PHR	-.019
$P_X{}^{FC}$	→	PHR	-.491
P_M	→	PHR	.427
C_2	→	PHR	.593
C_1	→	PHR	-.265
Y	→	PHR	-.267
Y	→	UEM	-.054
C_1	→	UEM	.434
C_2	→	UEM	-.484
P_M	→	UEM	-.546
$P_X{}^{FC}$	→	UEM	.509
I	→	UEM	-.093
P	→	UEM	.093
E	→	UEM	.000
W	→	UEM	.000
W	→	Π	-.200
E	→	Π	-.063
P	→	Π	.079
I	→	Π	.000
$P_X{}^{FC}$	→	Π	-.712
P_M	→	Π	.280
C_2	→	Π	.347
C_1	→	Π	.000
Y	→	π	.239

Index (P) by -.209 and increase it by .098 respectively and similarly total wealth(W) increases by .432 and .407 respectively. Results are not significant at .05 level.

$C_2 = -0.230\text{i} + 0.191\ \text{M} + e_9$ (9)

Equation (9) shows that final consumption expenditure (C_2) has a negative relation with the interest rate and positive relation with money supply. Estimates of (9) shows that One SD change in interest decrease consumption expenditure (C_2) by -0.230 and similar increase in money supply increase consumption expenditure (C_2) by 0.191.Results are highly significant.

5.2.4b Significant Results of Output Variables

Finally, the standardized coefficients of estimation equation (10-13) of output variables after setting regression weight equal to 0 of their intermediate variables whose impact is highly insignificant. Given below are the equations derived by the above results in table 5.2.4b of intermediate variable on output variables.

$\pi = -0.063\text{E} - 0.712P_{X^{FC}} + 0.280P_M + 0\ \text{I} + 0\ C_1 + 0.\ 239\text{Y} - 0.200\text{W} + 0.079P + 0.347C_2 + \text{e}.$ (10)

Equation (10) shows that P_M, Y, P and C_2 have positive relation with inflation (π) implying they are directly proportional and E, $P_{X^{FC}}$ and W have negative relation with inflation (π) implying they are inversely proportional. Estimates of (10) shows that One SD change in P_M, P, $C_2$and Y increase inflation (π) by 0.280,0.079,0.347 and 0.239 respectively and E, $P_{X^{FC}}$ and W decrease it by -0.063,-0.712 and -0.200 respectively. While W, $P_{X^{FC}}$, P_M, C_2 and Y have significant effect on π at .05 level.

$\text{UEM} = 0\text{E} + 0.509P_{X^{FC}} + 0.093P_M - 0.093\text{I} + 0.434\ C_1 - 0.054\ \text{Y} + 0\text{W} - 0.025\ P - 0.484C_2 + \text{e}.$ (11)

equation (11) shows that $P_{X^{FC}}$,P_M, P, C_1 have positive relation with unemployment (UEM) implying they are directly proportional and I, C_2 ,Y have negative relation with unemployment (UEM) implying they are inversely proportional. Estimates of (11) shows

that One SD change in P_{XFC}, P, C_1 increase unemployment (UEM) by 0.509, 0.093, 0.025and 0.434 respectively. Similarly I, C_2 ,Y decrease it by -0.093,-0.484 and -0.054 respectively. While P_{XFC}, P_M, P, C_1, I and C_2 have significant effect on UEM at .05 level.

PHR=0E− $0.491P_{XFC}$ + $0.427P_M$ − 0.019 I − $0.265C_1$ − 0.267Y − 0.061W − $0.065P$+ $0.593C_2$+e. (12)

equation (12) shows that P_M , C_2 have positive relation with poverty headcount ratio (PHR) implying they are directly proportional and P_{XFC}, C_1,I,Y ,W have negative relation with poverty headcount ratio (PHR) implying they are inversely proportional. Estimates of (12) shows that One SD change in and C_2 increase unemployment (UEM) by 0.427 and 0.593 respectively. Similarly P_{XFC}, C_1, I, Y ,W decrease it by -0.491, -0.265, -0.019, -0.267 and -0.061 respectively. While $P_{M,}, C_2$, P_{XFC}, $C_1$and Y have significant effect on PHR at .05 level.

GI=0E − $0.803P_{XFC}$ + $0.402P_M$ − 0.122I +$0.066C_1$+ 0.061Y + 0.228W − $0.061P$+ $0.161C_2$+e (13)

equation (13) shows that $P_{M,}, C_1, Y, W$ $and C_2$ have positive relation with Gini coefficient (GI) implying they are directly proportional and P_{XFC},I, P have negative relation with Gini coefficient (GI) implying they are inversely proportional. Estimates of (13) shows that One SD change in $P_{M,}, C_1, Y, W$ $and C_2$ increase Gini coefficient (GI)) by .402,.066,.061,.228 and .161 respectively. Similarly P_{XFC},I, P decrease it by -.803,-.122 and -.061 respectively. While P_M , W , C_2 P_{XFC} and I have significant effect on GI at .05 level.

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Comparison: a.2005 and 2015 estimation results:

equation (1) of both years show the same relation of i and M with E but results of both are not significant at .05 level i.e. positive relation with i and negative with M Equation (2) of both years show the same relation of i and M with P_X^{FC} and results of both are significant at .05 level i.e. negative relation with i and zero relation with M. Equation (3) of both years show the same relation of i and M with P_M and results of both are significant at .05 level i.e negative relation with i and zero relation with M. Equation (4) and (5) do not show any relation with i and M with I and C_1 in year 2005 while in 2015 impact of i is significant on I and C_1 i.e. negative relation with i. Equation (6) of both years show same relation of Y with i. these results are significant at .05 level i.e. Negative relation with Y. Equation (7) of both years show same relation of P with i and M. but 2005 results are significant at .05 level i.e. Negative relation with i and positive relation with M. Equation (8) of 2005 shows significant impact of i and M on W while 2015 show insignificant results i.e. positive relation with i and and M. Equation (9) of both years show the same relation of i on C_2.Results are significant at .05 level i.e negative relation with C_2 .

Equation (10) of 2005 shows significant impact of I, C_1,Y,P and C_2on π where I, Y and C_2 have positive relation with π while in 2015 shows significant impact of P_M ,P_X^{FC} ,W,Y and C_2 on π where P_M, Y and C_2 have positive relation with π.Equation (11) of 2005 shows significant impact of I, P_M ,P_X^{FC} , C_1, C_2,Y and W on UEM where P_X^{FC},Y and C_1 have positive relation with UEM while 2015 shows significant impact of P_M ,P_X^{FC} , C_1,I,P and C_2 on UEM where P_M ,P_X^{FC},and C_1 have positive relation with UEM. Equation (12) of 2005 shows significant impact of I, P_M ,E , $C_2$and C_1 *on* PHR where E, I and C_2 have positive relation with PHR while 2015 shows significant impact of P_M ,P_X^{FC} , C_1 and C_2 on PHR where P_M and C_2 have positive relation with PHR.Equation (13) of 2005 shows

significant impact of I, $P_{X^{FC}}$,P_M,W,Y, $C_2$and C_1 on GI where $P_{X^{FC}}$,Y and C_2 have positive relation with GI while 2015 shows significant impact of P_M ,$P_{X^{FC}}$, W, I and C_2 on GI where P_{M} ,W and C_2 have positive relation with GI.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

By comparing both results of 2005 and 2015 we can conclude that although interest rate and money supply are the important factors in impacting SEI but there must be other factors which must impact SEI i.e. country's law and order, security, corruption, education, health and natural resources. In our research we have found that more interest rate and less money supply implies decrease in P_M ,$P_X{}^{FC}$, C_1,I,P,Y and C_2 which results in decreasing π if its effect is more dominant on P, I,Y and C_2(2005) and C_2, P_M and Y(2015) which is in line with Smets and Wouters (2002) and Mohanty (2012). While less interest rate and more money supply increases P and W and increases π which is in line with previous studies e.g. (bank of England 2012).

we found that more interest rate and less money supply implies decrease in P_M ,$P_X{}^{FC}$, C_1, I, P,Y and C_2 which results in decrease in UEM if only $P_X{}^{FC}$ and C_1 are effected by tight monetary policy and if other variables P_M, C_2 and I are effected more than this will definitely increase UEM significantly which is in line with previous research Blanchard and Wolfers (2000) while less interest rate and more money supply increases P and W and its effect is negligible on UEM.

Moreover we found that decreasing interest rate and increasing money supply implies increases in P_M ,$P_X{}^{FC}$, C_1,I,P,Y and C_2 which results in decreasing PHR through the channel of P_M ,$P_X{}^{FC}$, C_1 and Y while it results in increasing PHR through C_2 channel.

In the end we found that decreasing interest rate and increasing money supply implies increases in P_M ,$P_X{}^{FC}$, C_1,I,P,Y and C_2 which results in decreasing in GI through I and C_1 channel while C_2 will cause increase in GI which is partially in line with Galli (2001).

6.2 Recommendations

Monetary policy main focus should be made in improving GI, UEM and PHR rather than controlling π. Rate of interest should be kept to zero or negative in case of small loans in which rate of return to borrower is negligible and money supply should be focused more than the interest rate in setting up monetary policy. Monetary policy should be based on compassion rathe'r than controlling inflation to improve SEI. We also recommend that controlling inflation through interest rate is dangerous as UEM increases which results in poverty. Banking system should be friendlier in terms of taking loans and loans must be given according to person's ability instead of the net worth of that person or its power. As one of the famous bankers Mushtaq Ahmed Yousafi said that if you want to take a loan from bank, you have to prove it that you don't need it at all. Also small loans must be forgiven more easily instead of large ones as J.P Getty, one of the American industrialist put the entire system in one line, "If you owe bank 100 dollars that's your problem and if you owe bank 100 million dollars that's banks ' problem"

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APPENDIX

i: Real interest rate (%)Real interest rate is the lending interest rate adjusted for inflation as measured by the GDP deflator. The terms and conditions attached to lending rates differ by country, however, limiting their comparability.

M: Broad money growth (annual %)Broad money (IFS line 35L..ZK) is the sum of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveler's checks; and other securities such as certificates of deposit and commercial paper.

C_1: General government final consumption expenditure (constant 2010 US$) General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation. Data are in constant 2010 U.S. dollars.

C_2: Final consumption expenditure (constant 2010 US$) Final consumption expenditure (formerly total consumption) is the sum of household final consumption expenditure (formerly private consumption) and general government final consumption expenditure (formerly general government consumption). Data are in constant 2010 U.S. dollars.

$P_X{}^{FC}$: Goods exports (Bop, current US$) Goods exports refer to all movable goods (including nonmonetary gold and net exports of goods under merchanting) involved in a change of ownership from residents to nonresidents. Data are in current U.S. dollars

Y: GDP (current US$) GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars. Dollar figures for GDP are converted from domestic currencies using single year official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used.

I: Foreign direct investment, net (Bop, Current US$):

Foreign direct investment are the net inflows of investment to acquire lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor.it is the sum of equity capital, reinvestment of earnings, other long capital, and short term capital as shown in balance of payment. This series show total net FDI. In BPM6, financial account balances are calculated as the change in assets minus change in liabilities. Net FDI outflows are assets and net FDI inflows are liabilities. Data are in current US$ dollars.

W: Total Reserves Millions of SDRs: End of Period P: Consumer Prices Percent Change over Previous Year; Calculated from Indices

P_M: Goods imports (Bop, current US$) Goods imports refer to all movable goods (including nonmonetary gold) involved in a change of ownership from nonresidents to residents. Data are in current U.S. dollars.

E: National Currency Units per SDR: End of Period (aa) UEM: Unemployment, total (% of total labor force) (modeled ILO estimate) Unemployment refers to the share of the labor force that is without work but available for and seeking employment.

P: Consumer prices index

percent change over previous year; calculated from indices

GI: GINI index (World Bank estimate)

Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.

PHR: Poverty headcount ratio at $3.20 a day (2011 PPP) (% of population)

Poverty headcount ratio at $3.20 a day is the percentage of the population living on less than $3.20 a day at 2011 international prices. As a result of revisions in PPP exchange

rates, poverty rates for individual countries cannot be compared with poverty rates reported in earlier editions.

П: Inflation, consumer prices (annual %)Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.