Testing of Endogeneity of Money Supply under Post-Keynesian View: Evidence from Panel Methods

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CERTIFICATE

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I, Atiq ur Rehman, 2015PIDEFMPHILETS21 hereby declare that I have produced the work presented in this thesis, during the scheduled period of study. I also declare that I have not taken any material from any source except referred to wherever due that amount of plagiarism is within acceptable range. If a violation of HEC rules on research has occurred in this thesis. I shall be liable to punishable action under the plagiarism rules of the HEC.

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Dedication

This work is dedicated to my beloved parents, ,y family members, brothers and my best friends, Hamad Manzoor Chughtai, Kizyya Baloch, Zia ur Rehman, Shafi Faxal, the members of Pentagon-7 and Hoshab Group.

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Abstract

This study contributes to the ongoing discussions about endogeneity of money supply by empirically investigating the G-20 economies including South Asian countries. We used panel data to test the endogeneity of money supply of Post-Keynesian school of thought. The econometric techniques provide exactly quantified results; but, these results are mostly sensitive due to misspecification of the background of theory which has been applied in econometric techniques. The econometrically sensitive results describe the coefficients' changes which misguide towards policy making process. To check the endogeneity of money supply we proposed an econometric technique-the Generalized Method of Moment (GMM) and C-Statistic. The (C-statistics) direct test of endogeneity of money supply that depend on econometric specification of exogeneity which has not been used in previous literature for panel data evidence. The study provides that the monetary aggregates and money multipliers are endogenous and also endogeneity of money supply exists there in G-20 economies including the Asian countries. There is a two-way relationship between fiscal deficit and bank credits because the results of fiscal deficits are supporting the structuralist and liquidity preference views. The findings also certified and supported the post-Keynesian school of thought that the money is endogenous. That is why the endogeneity of money supply proportionally increasing in G-20 economies and South Asian countries.

Keywords: *G-20 economies including south Asian countries, Endogeneity of Money Supply, Post-Keynesian School of thought, Generalized Method of Moment, C-Statistic.*

Chapter 1

Introduction

Over the last century, the money supply and monetary balances have got much controversial discussion, since the advent of Keynes. Classical and Keynesian provided different arguments in the favor and contrast about the role of monetary sector. The contribution of economists in the advancement of money as a policy tool and intermediate target for the stability of an economy remained remarkable. Side by side, the policy makers and followers of the different school of thoughts ameliorated the role of money in the economy. The ups and downs in the economies brought challenges for economic theorist about the presence and impact of the money supply.

Currently, the money is being created through credit creation by commercial banks and financial institutions; which, affects the money supply. Most of the money in circulation is created, not by the issuance of Central or Federal Banks, but by the commercial banks. Banks create money whenever they lend money to borrowers or deposit money from lenders. This, in turn, affects the prices (in terms of interest rate) and quantities (in terms of issued loan) of bank dealings in an economy.

McLeay *et al*. (2014) finds that the majority of money available for use is basically created through private sectors, not by the printing presses of the Central Bank. The banks create loans by lending the customers or borrowers. In the economy, the process of creating loans are effecting the money supply. Sigurjonsson (2105) gives an argument that the monetary base is regularly under 5% of the broad money. More than 95% of the money in presence

is created by private banks. The debate amongst endogenous and exogenous of money theories lies in this process how much control private banks have. In this manner, the government does not determine the amount of money in circulation, but it depends on the choice of commercials banks and the borrowers.

Although money can be described in several ways; but for simplicity and precision, it is categorized in two types. First type is that the money which is created or determined by central bank i.e. (the narrow money or the monetary base). The second type is that the money which is being created by the private banks. Thus, the private banks make advances, then these advances are used for the creation of money and then borrow reserves to fulfill the reserve requirement prescribed by central bank. The new modes of money were introduced with the development of businesses. One of the most prominent is financial instruments which is usually issued by financial institutions. These financial instruments offer higher liquidity to the holder of instruments. Now-a-days, there are large markets available for transaction of these instruments. These instruments can be easily renewed to money. Because these financial instruments and financial institutions can operate outside the domain of regulations; the process is ascribed as shadow banking system.[1]. The creation of money in shadow banking system is known as shadow money[2]. Furthermore, this is now-a-days, gaining importance in the modern economy (Zaman, A. (2015).

The traditional theory of money supply postulates that money supply is exogenous. However, the Post-Keynesian economists have seriously questioned the validity of this

[1] The financial intermediaries which are involved assisting the credit creation across the global financial system.

[2] Repo (repurchase) liabilities backed by tradable collateral (e.g. money market funds etc.) is known as shadow money.

general perception. More specifically, the researchers, based on the empirical evidence, have strongly maintained that money supply is determined endogenously. In literature, this contribution is associated with the Post-Keynesian stream of a thought. It is also important to mention here that the exogenous money supply along with stable money demand function is an important element in the Monetarists' model; that asserts the effectiveness of monetary policy. On the other hand, post-Keynesians advocate the concept of endogeneity of money supply since the ultimate goal of economic activity is to create money. Therefore, we can safely claim that one of the controversial issues in monetary economics is the debate over the concept of exogenous and endogenous money.

More specifically, the endogenous money means that money supply is being created endogenously through credit. This means that commercial banks are the primary issuers of endogenous money and based on the demand from creditworthy customers. So, the central bank has far less control over the money supply than one might believe from the money multiplier theory. This is the central point of the understanding endogenous money. More specifically, the supporters of Post-Keynesian theory found that the two-main empirical evidence to confirm their postulation [Shanmugam *et al.* (2003)]. Firstly, various econometric results confirm that the money supply is endogenous (Nell 2000; Vera 2001 etc.). Secondly, money endogeneity is explained with other macroeconomic variables. According to a later aspect, Cifter and Ozun (2007) analyze the correlation between money, interest, inflation, and productivity using VECM models. Therefore, we can postulate that the debate over the exogenous and endogenous money supply concepts has become in recent years is an empirical issue. The debate motivates the researchers to empirically re-test the hypothesis of exogenous/endogenous money.

Most of the estimation techniques are based on the several assumptions. One of the assumptions is here when there is a structural break in a series. In such situation applying Augmented Dickey-Fuller to check stationarity of a series will give misleading results. Furthermore, estimating Ordinary Least Square (OLS) with structural breaks violates the assumption of OLS such as normality of the series etc. So, the results give wrong explanation about the theory. The same case occurs in the presence of outliers of a series.

Besides, there are diverse techniques for time series econometrics to check causality among lagged estimations of variables. In econometrics, time series techniques have a different type of limitations. Above all, the outcomes exceedingly rely upon lag selections. Second, at times like Co-integration tests; they just measure and check either the two variables move together or not over the time. Third, the causality tests don't present the indication of the relationship between two variables. We can also say while applying the causality, it does not provide the exact relationship either the variables have positive integers or negative.

However, most of the literature has not used to check the contemporaneous relationship between money aggregates and the bank credits. The econometric techniques provide exactly quantified results; these results mostly sensitive due to misspecification of the background of theory which has been applying in econometric techniques. The econometrics sensitive results describe the coefficients changes which misguide towards making policies.

There is a plethora of research that applying econometric techniques for testing exogeneity and endogeneity of money, in several studies, found inconclusive results. In the previous

studies, different types of econometric techniques have examined, like time series analysis, balance sheet analysis and just in a few studies, panel data have been proposed. This empirical controversy among the researchers on the issue of exogeneity and endogeneity of money motivates us to re-investigate it further. As in the previous study, the C-statistic test has been used in case of time series but we are proposing the C-Statistic in panel data.

1.1 Rationale of Study

It has been stated out of quest that money supply is exogenously identified. In most of developed and under developing countries. It is found that money supply is exogenous because Central Bank is the sole controlling authority of the rhetoric of money supply policies. According to Classical School of thought that the money is exogenous. Keynesian and Monetarist school of thought also support the idea that money is exogenous. In other words, the money supply has significant effect and also exogenous money supply upsurge can produce but merely in short run and output effect. For the new Keynesians, money is endogenous because credit channel is applied through the commercial bank's lending channels as well as firm's balance sheet (Bernanke *et al.* (1995). According to neo-classical approach, money supply is strictly determined through Central Bank (CB) creativities. Yet, many schools of thought dissent this idea such as; Post-Keynesian according to whom money supply endogenously determined with in the financial markets i.e. the banking system. There are several significant allegations of endogeneity of money. Thus, in this regard, validdity about this general perception the Post-Keynsian economists have serious questioned. The notion of endogeneity of money becomes vital and its source is the 'inside

money'[3] which means that money is actually being produced by the private sectors rather than the government sector, for instance, the monetary base or central bank. Furthermore, sometimes the bank deposits identified as inside money and outside money as currency (Hartley *et al.* (1991). Many econometrics studies have been conducted to check how the relationship among the variables of endogeneity of money would work out. So, to test the endogeneity of money, this study will use some suitable econometric techniques to decipher the results for the endogeneity of money in a better manner.

1.2 Objective of the Study

- to test the endogeneity of money supply for the selected panel of countries.
- to check the robustness of the contemporaneous relationship between money supply and bank credits by C-Statistic for endogeneity.

1.3 Organization of Study:

The organization of the study is given below: The first chapter of the study has explained the introduction, significance of the study and objective of the study. The second chapter deeply studies theoretical background and the review about the endogeneity of money as well as econometrics review. The third chapter discusses analytical frameworks and econometrics technique i.e. Generalized Method of Moment and C-statistics which is also known as the difference in Sargan-statistics. The chapter fourth describes the variables, time period analysis of the study, region analysis and the source of the data. Chapter fifth

[3] This general argument is demonstrated within the framework of a stochastic, rational expectations model that distinguishes between the liabilities of the central bank (outside money) and the liabilities of private financial intermediaries (inside money).

includes the empirical results and discussions, and chapter sixth provides the conclusions as well recommendations.

Chapter 2

Literature Review

This chapter is about the theoretical background and empirical review regarding the endogeneity of money supply. The research produces an excess of studies about the endogeneity of money supply. The literature focuses about endogeneity of money supply through post-Keynesian point of view with three different schools of thoughts. This chapter entails theoretical background of study and includes literature review in four sections. The first section contains literature about endogeneity of money through private banks. Second section includes literature about endogeneity of money in the Post-Keynesian framework. Third section of this chapter contains endogeneity of money supply based on econometric literature and the fourth section endogeneity of money supply literature in case of Pakistan.

2.1 Theoretical Background

The historical background of money has defined by different schools of thought. The first group of economists neo-classical and monetarists argues that the money supply determined exogenously in an economy. In order to gauge the balance of the money demand and to oversee that how the exogeneity money and endogeneity affect the entire process of ups and downs in the monetary policies is highly essential. Other side, Post-Keynesian economists explain that the entire process of the supply of the money is actually linked to and determined by the endogeneity that prevails in the fiscal markets. By tracing history of modern monetary economics, two different views appeared on the role of central

bank with regards to the near to economic accomplishments and money supply in any economy of the countries. The outcome put through the empirical measures is much different when it comes to the endogeneity of the money supply. The theory of endogeneity of money, the theory which is not only essential to propose the shifts in the monetary policies of a particular country, in fact, it helps understand to properly regulate the monetary policies to avoid sudden plunges and fluctuations. They also put the argument forward that the central banks are not empowered to impose any constraints in the money stock in the quantitative terms.

The post-Keynesian school of thought does not recognize the macroeconomic models as the base upon which the monetary policies are to be erected. It even does not recognize the major school of thought of the New Classical and their patient models like that of the New Keynesian view and Monetarists school of thought. According to their views that the money supply is not at all in the control of the central banks as they already have very limited powers, besides that the credit supplies are also not significantly effective in this regard (Pollin, 1991).

The most important theory forwarded by the post Keynesians is that of the endogeneity of the money supply. The arguments and the counter arguments explain; the money is both the endogenous as well as the exogenous explained by different schools of thoughts. Given this contraction in the arguments and the point of views of the economists, different theories and tests have appeared on the scene with different confusions and views who think in the both categories endogenous as well as the exogenous ones. To make it concise and clear, generally endogeneity of money supply is separated into three views as follows Shanmugam *et al.* (2003):

1) The Accommodationist View.

The overnight interest rate established by central bank and commercial banks fixed their loan above the overnight interest rate so, the banks effort to come across all demands for bank loans. It is specifying there is two-way (reaction) association or link among the two variables.

2) The Structuralist View.

According to the structuralist the central bank is also a significant feature and the bank credits can cause by money. We can say there is two-way association among the monetary base and bank credits.

3) Liquidity Preference Opinion.

This school of thought argues there is bidirectional relationship amongst the bank credits and the monetary aggregates i.e. (M1, M2, and MB). Similarly, there is feedback mechanism occur among the bank credits and money multipliers.

2.2 Empirical Review

In the following, the empirical review is given of the endogeneity of the money. In the case of Pakistan, the bank sectors and the post-Keynesian theories are seen through the prism of economic techniques. Also, empirical literature discussed in this session for econometric problems.

2.2.1 Money Endogeneity and Banking Sector

According to Palley (1991), the theory endogeneity of money explains the money supply is always determined through the actions of monetary authority in a joint manner along the decisions of the banks of commercial nature and the assets and liabilities as well as the decisions of the non-bank public which is also affected by the loans demands. The monetary theories which are the central banks, in other words, have the power to change the interest rate that gives the banks the powers as monopoly supplier who exercises the power to determine the prices in a direct manner.

As discussed in past examination that the money is endogenously picked through joint exercises of cash related star. However, Goodhart (1994) demonstrated the key issue is, paying little respect to whether a free dealing with a record system, without a CB, would hang on keeping cash crises and concretes, or would be commonly vigorous in this manner. He built up that every one of the all-inclusive community who has worked in a Central Bank acknowledged that the monetarist view is totally stirred up. Furthermore, the observational affirmation ought to be extended specially to make countries. The business banks' crediting conduct in Greece revealed that credit trade was out a general sense controlled by sparing exchange structure out the light of fervor for propels.

The past examinations have stirred up that assessing whether a national bank reaction plan is unwavering or impeccable from an open welfare position requires "detail of an aggregate accomplice macro economic model thusly, Moore (1998), a supporter of the accommodationist view, proclaimed that national bank targets credit costs and a concise time period later unendingly mix or hindrance stores to keep the financing costs at its goal

level. The money supply and budgetary base are, effortlessly endogenous, controlled by the measure of bank credit creation, at the move cost set exogenously by the national bank. In addition, Kalemli-Ozcan *et al.* (2001), in their exchange of the welfare picks up from fiscal or monetary unions, demonstrate that the welfare level might be higher if business cycle synchronization is diminished or decreased for the "prosynchronization hypothesis" ("hostile to synchronization hypothesis"). Yet diminishing with the covariance between the total GDP and the part's or member's GDP. The presence of a causal connection between bank credits to cash supply is neither fundamental nor a satisfactory condition for testing the endogenous of cash supply or endogenous cash theory.

Shao (2010) claim of credit apportioning models indicates when the impact of monetary policy more grounded on yield they misplace it might be when the credit conditions are tight. It is discovered, when money is endogenous then because of endogenous money supply the US aggregate couldn't convey extensive sign or indication of a threshold impact on the connection among money and output data. Considering other target factors, the money related strategy producers discovered importance impact of the threshold. Nonetheless, the story might be disparate when the presence of monetary policy related approaches extremely considered.

On the contrary, the views of the accommodationist in this regard are total to the opposite side of above-mentioned arguments. The accommodationist view argued that central bank is only confined to the powers of regulating interest rates and does not exercise wider control over the money. The structuralist differs in this regard, they view powers of the central bank as wider in terms of controlling the liabilities of the assets, and thus, they can affect the monetary policies. The central bank, hence, can exercise its powers on the interest rates,

or it can exercise its powers on the assets and liabilities, in both contexts, the central bank has an edge over the monetary policy. There are however some ignored and neglected facts like that of the facts monetary variables are endogenous. The credit rationing model becomes questionable if the monetary variables are endogenous. A slight change in the rationing model or a slight misplacement o the credit can entirely change the outcome and output of the monetary policy. (Shao, 2010).

2.2.2 Money Endogeneity in Post-Keynesian Framework

The liquidity preference theory is entirely based on asset prices. This theory is by no means a theory pertinent to money demand or it does not play a vital role in defining the interest rates. As a matter of fact, when the frequency of the liquidity of the assets rises, the adjustment of the prices comes in such a manner that liquidity (l) rises in relation to returns of those that come from prospective net yields ($q - c$), [Lekachman *et al.* (1964)]. The economics staying with the post-Keynesian school of thought still follow to the fact that supply of money is endogenous. They believe that the commodity money, as well as credit money, are generated by lending of the banks and they can only be controlled or ended by the replying of the given money to banks.

The previous studies have shown different flaws in the monetary system and a variety of differing views on how banks control money or how monetary policies are regulated. There are certain studies that show the differing views upon endogeneity or they differ in the money reserves and currency stability.

Browne *et al.* (1997) they found through the examination, Post Keynesian economics is quantifiable by its accentuation on the impacts of instability. Keynes' hypothesis or Keynesian theory of liquidity preference is an endeavor to depict how changing perspectives around an indeterminate future, in connection with the foundations which make securities marketable, are connected to yield and work (employment). The basic insights underpin of the formal model this issue does not exist with liquidity preference and this at least must not be with liquidity preference. Or maybe, the issue is that the thoughts themselves are of a sort that resists articulation by formal means.

Subsequently, liquidity preference theory, Kaldor, and Trevithick, (1981) they conclude, according to Post-Keynesian economist's that money is endogenous. Not at all like commodity money, through bank lending, the credit money appears (exist) and is doused by the reimbursement of bank obligation. The adjustment sought after for bank credits cause due to adjustments in money income, which thusly influences monetary base. Fundamentally, Pollin (1991) talked about post-Keynesian's major component is that the money is endogenous. It recommends to the theory that for the nearness of money supply in an economy is driven by the necessities of the bona fide or genuine yield under the market requirements and is joined with a national bank.

However, Moore (1998) and Fontana (2003) define that Post Keynesian theory reiterates the supply of money is determined by the fact the credits are generated when banks exercise their powers over the assets and liability and their decisions with regards to the commercial banks also, assets management. Fontana *et al.* (2003) argued that monetary policy has different propositions and different approaches to deal with and explain with.

Holtemöller (2003) done study on German, using the quarterly information, adopting the vector error correction model on monetary aggregates, endogenously decided afterward the Bundesbank established interest rate of money market, the restricted money multiplier approach in earlier reports. The one channel to be specific, the banks and the national banks could completely suit on all demand on behalf of money i.e. accommodationist method of the Post Keynesian approach or theory as given by Wray (2003).

Badarudin *et al.* (2013) argue that several flaws have been studied and questions pertinent to the flaws and, differing opinions among the economists have been addressed to some extent. The differences still fail to explain whether the money that is credited from actions of the central banks is endogenous or the money is exogenous in case the actions of the monetary policy are affected by the central bank policy actions. Therefore, it becomes crucial for the researcher to establish a statistical relationship between the endogenous supply of money and actions of banks upon those stocks which remains unexplored to a greater extent.

Moreover, in late studies, Nayan *et al.* (2013) Milton Friedman[4], according to the other group of economists' basically, money is not exogenous it is endogenous because the money creation occurs in the economy. Thus, it is endogenously decided whether money arrangement or transformation transpires to pass inside the money related arrangement of an economy.

[4] 50 years prior, Milton Friedman's promotion of free markets over government mediation and his solution for inflation battling by national banks were dealt with as periphery ideas by numerous financial experts. When the Nobel Prize-winning financial analyst kicked the bucket yesterday at 94 years old, his perspectives had reshaped current capitalism.

2.2.3 Endogeneity of Money and Econometrics

To explore endogeneity empirically, the direct test of endogeneity of money procedures is used through the econometrics classifications of endogeneity and applications to test empirically the endogeneity of money. In econometric hypothesis writing and literature theory, endogeneity is clarified as the situation when the autonomous variable (independent variables) in a regression model is related to the error term. As, Wooldridge (2010), when there is synchronous causality, illustrative variable (xi) and the error term (u_i) corresponds and OLS estimation gets the two advances and in reverse impacts, in this manner prompting one-sided and conflicting coefficients. There is likewise an omitted variable is bias, which influences the dependent variable and relates to more informative factors, which are excluded from the regression.

Applying verity of econometrics methods for exogenous and endogenous money supply or for money, in a few investigations have been discovered that in a few countries the money is exogenous and a few countries the outcomes portrays money is endogenous. The exogeneity also discussed by Hendry (1995) suggests that the concept of exogeneity is determined the outside the system through the analysis. The counter example to instinctive formulation the requirement that the variable deem to be exogenous should sustain valid inference when it is treated as given. To fulfilling that requirement and concerns conditionals inference about the parameters of interest without loss of information this is through the notion of weak exogeneity. The Cobweb relates the concepts to economic notions. For forecasting the concept of strong exogeneity display that it is with Granger (1980) non-causality to provide a basis for conditional forecasting. Furthermore, the super

exogeneity extend the weak exogeneity to include the invariance of the parameters of the conditional model to interventions to affecting the marginal model in order to sustain the conditional policy analysis.

The furthermore, Tas et *al*. (2012), the various examinations utilized different kind of econometrics strategies like causality (Granger Causality tests, Cointegration and also Error Correction techniques etc.). These strategies test the causality amongst bank credit and miscellaneous monetary aggregates on or after a time series point of view. This is basically caused by the way that there is a wide range of techniques for time-series econometrics to test causality among lagged estimations of factors or variables. These given time-arrangement strategies have a few huge confinements these methods have numerous significant limitations by using time series models. As a matter of first importance, the outcomes exceedingly rely upon lagged determination. Second, now and again like Cointegration tests, they just measure whether two factors move together after some time or does not move together over the time. In this way, they don't specifically test causality however they are surmised trial of the connections. Third, the causality tests do not present the indication of the connection among the two variables.

Furthermore, Shanmugam *et al.* (2003) by utilizing Econometric strategies of Granger causality, cointegration and error correction model the exact empirical results are solid with the Post Keynesian hypothesis which is the money supply is endogenous. Fontana (2003) debate that there is likewise a considerable measure of useful inquiry of characterizing the causality amongst money and money reserve. The causality does not hold between the money and money reserve. Hayashi (2000) suggests a regressor is endogenous if the regressor is not determined which is not orthogonal with the or towards error term.

As indicated by, Baum *et al*. (2007), endogeneity is clarified as the situation or case when the autonomous (explanatory) variable relates to the error term in a linear regression model. From an econometric hypothesis viewpoint, the difference between exogeneity and causality does not clearly exist in exist causality studies. For testing the endogeneity of money hypothesis, the occurrence of the causal relationship among the or from the bank credits towards money supply is neither a sufficient condition nor necessary. In this way, the trial of over-recognizing confinements, to testing for endogenous of money supply the C-statistics is used, which is used by Tas *et al.* (2012) that was recommended by Baum *et al.* (2007). Based on the instrumental variable, the C-statistics and regression models have been used in the methodology. To explore the contemporaneous[5] relationship between the money supply and money aggregates variables the C-statistic technique has allowed for exogeneity.

2.2.4 Endogeneity of Money Supply in Pakistan

Ahmad and Ahmed, (2006) by applying Granger Causality test they presume that there is a fractional support to accommodative endogeneity in the short run. Likewise, in case of short run, with the structuralist's view on endogeneity of money. The liquidity preference theory of money endogeneity is reliable. They accomplish that in the case of Pakistan the money supply is endogenous in short run. Nonetheless, over the long, they found the money supply is exogenous in Pakistan. The consequences of one-way causality that runs from money supply to bank advances (loans) and runs from base money (M_0) to bank advances

[5] It is a relationship between dependent variable and explanatory variables. e.g.$y_t = \alpha_0 + \alpha_1 x_t + \varepsilon_t$, it implies a 'contemporaneous effect' (the present value of y_t depends on the present value of x_t.

the fact found over the long period or longer period. Outside the period of twenty-four months the state bank of Pakistan (SBP) can decide or determined the money supply magnificently.

The literature gap of the study is, to test of endogeneity of money, not more studies have been done in Pakistan about the endogeneity of money. Endogeneity of money test by applying several econometrics techniques in time series as well as panel data but C statistic (Sargan-in-difference) does not used in panel data. This is our contribution in econometric technique to test the endogeneity of money and also the empirical study on endogeneity of money has been never found available literature for G-20 economies also for south Asian countries.

Chapter 3

Analytical Framework and Econometric Strategy

In this chapter, we will discuss the test for endogeneity of money, analytical framework, and econometric strategy. Also, we will discuss the post-Keynesian school of thought in form of empirically. In this section further, we will discuss econometric strategy briefly i.e. GMM and also C-statistic. We will use different variables with different instrumental variables to estimate the endogeneity of money supply. Finally, from the previous literature, we proposed these specific econometrics techniques. These econometrics techniques are as follows:

3.1 Analytical Framework

The analytical framework is being formulated on the different aspects of Post-Keynesian (hereafter, PK) view regarding the money supply.

The accommodationist see contends that aggregate or total demand should be communicated through demand for credits which cause an uninvolved reaction of money related foundations and specialists (Panagopoulos *et al.* (1998)). In other words, the overnight interest rate established by central bank and commercial banks fixed their loan above the overnight interest rate so, the banks effort to come across all demands for bank loans. Short-term demand for bank loans is determined by working capital finance, which

is needed by firms. It means that the money supply (M1, M2) is determined by the demand for bank loans (Bank Credits, BC).

The structuralist approach contends that the Central Bank (CB) is likewise a critical factor since it can confine settlement of reserve needs and limit credit development. Statistically, this suggests financial base can cause BC. Therefore, there is a two-route connection amongst BC and MB. Under the structuralist perceive, the CB can influence the supply of credit and henceforth total request. The liquidity preference perceive underpins the possibility of a bidirectional relationship between Bank Credits (BC) and money aggregates.

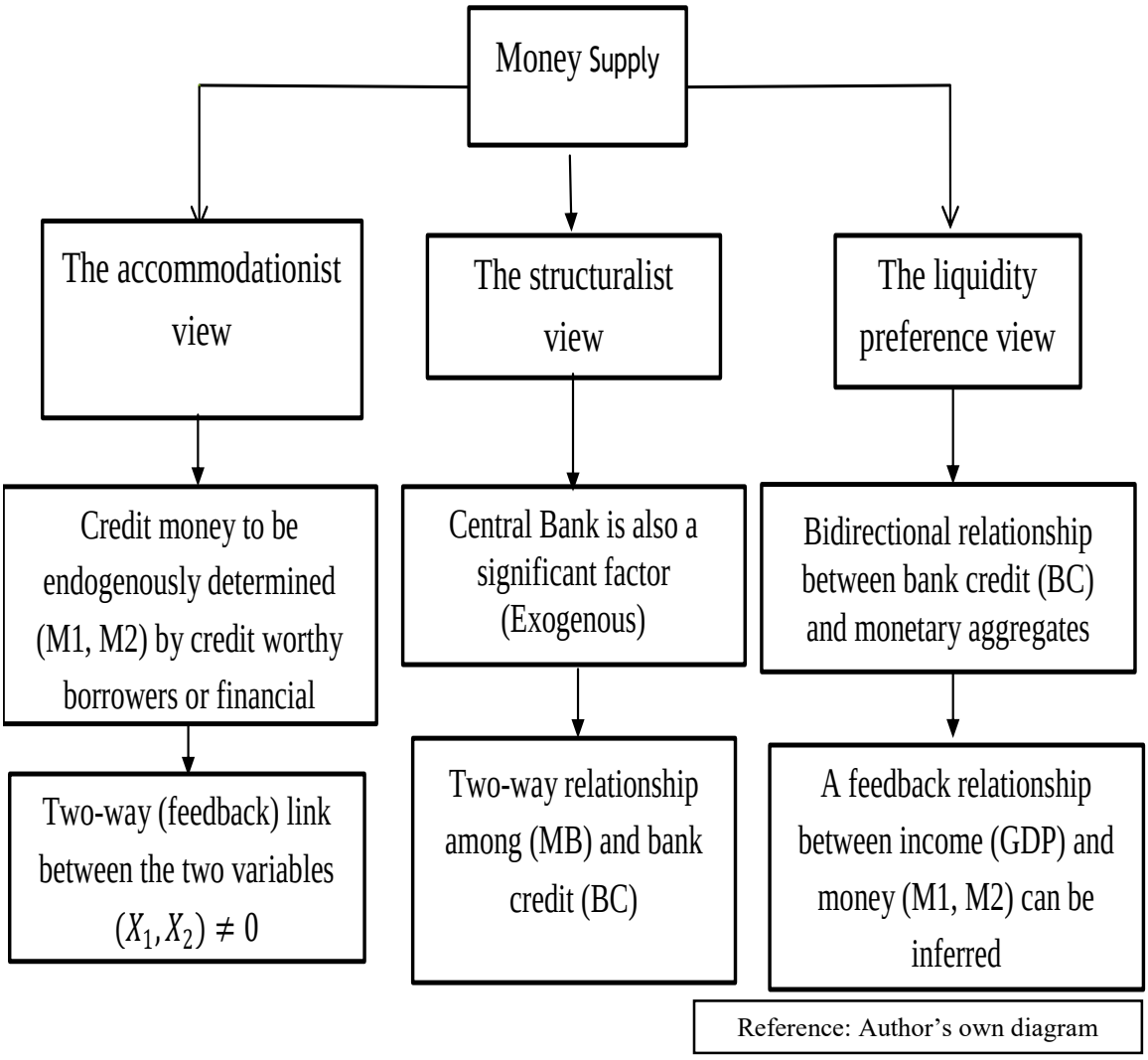
However, the Keynesian economic theory suggests that amount of money in circulation plays a vital role. For the requirements of successively of all trades and business within the economy, a convinced amount of money is required. It leads toward unemployment if there is insufficient money in the economy so, unemployment increase and some business will be unable to function due to lack of money. If there is excess money, it leads towards inflation. It creates demand when the money is more than needed. So, it is not sustainable as at this level, the economy might be at highest production, and the surplus demand leads to increasing prices or inflation (Zaman, 2015).

Under the bank loaning channel perspective of money, the money is endogenous through the conduct of private and regular commercial banks and the portfolio modifications of public dealings with commercial banks. In view of interest rate established/set by national banks, commercial banks modify their own lend portfolios, which is the procedure that makes credit money. This more recent substitute theory of money supply being endogenous

likewise denoted to, as PK theory of credit passage that makes money supply (Moore 1989).

The analytical framework is elaborated through the schematic version which is given as below:

Figure 3. 1: Analytical Framework



Reference: Author's own diagram

The functional form devised on the basis of arguments and explained relationships, under the shed of different views of PK theory are as follows:

1. *The Accommodationist View:* It claims that there is a unidirectional relationship from bank credits to the monetary base and the monetary aggregates. So, in the functional form, it is represented as:

$$M_{it} = f(BC_{it}) \quad (3.1)$$

Where M_{it} is either form of money i.e. MB, M1 or M2.

2. *The Structuralist View:* This view concurs with the accommodationist opinion on the connection amongst income and monetary aggregate, which inferred a bidirectional connection amongst income and monetary aggregates. Mathematically, it can be shown as:

$$M_{it} = f(BC_{it}) \quad (3.2)$$

$$BC_{it} = f(MM_{it}) \quad (3.3)$$

Where MM_{it} is either money (i.e. M1 or M2) or money multiplier.

3. *The Liquidity Preference View:* This idea supports the bidirectional relationship between total bank credits and monetary aggregates. It is similarly, a feedback mechanism occurs among total bank credit and money multiplier and a feedback relationship between income and money aggregates can be conditional from the liquidity preference.

$$BC_{it} = f(M_{it}, MM_{it}, FD_{it}) \quad (3.4)$$

$$GDP_{it} = f(M_{it}, MM_{it}, FD_{it}) \quad (3.5)$$

Where both equations (3.4) and (3.5) representing as; BC_{it} is total bank credits, M_{it} is representing the Money aggregates, MM_{it} is representing the money multipliers and the FD_{it} is describing the fiscal deficit. Where i=1, 2 and regressors are money and its multipliers respectively.

In this study, we are following the Post-Keynesian school of thoughts so, we will discuss the bank credits linear relationship with monetary aggregates and also, we will check the linear relationship between money income with monetary aggregates. The main equation is as below:

The main equation in panel:

$$LBC_{it} = \beta_0 + \beta_1 LM_{it} + \varepsilon_{it} \quad (3.6)$$

$$LBC_{it} = \gamma_0 + \gamma_1 LM_{it} + \gamma_4 FD_{it} + \varepsilon_{it} \quad (3.7)$$

$$LGDP_{it} = \beta_0 + \beta_1 LM_{it} + \varepsilon_{it} \quad (3.8)$$

$$LGDP_{it} = \gamma_0 + \gamma_1 LM_{it} + \gamma_4 FD_{it} + \varepsilon_{it} \quad (3.9)$$

The above mention equations 3.6 and 3.7 describing the linear relationship among bank credits with monetary aggregates as well as with fiscal deficit. The equation 3.8 and 3.9 representing the relationship income (gross domestic products) with monetary aggregates as well as with fiscal deficit, where LM_{it} is representing the Money aggregates, including the money multipliers.

3.2 Econometric Strategy

The econometrics techniques follow different assumptions which give miss-specified results. We start from pooled analysis in panel data in which the cross-sectional heterogeneity problem occurs. The panel data has advantage to handle the heterogeneity problem which exist due to cross-sectional units over the time. The fixed effect model captures the differences of cross-sectional over the time between countries by familiarizing dummies. Additional parameters to estimate the model efficiently for this purpose random effect model is used as time variant dummy variable.

Furthermore, one can enhance the OLS with in the presence of heteroskedasticity of unidentified shape by applying GMM. First, one must choose which additional moment conditions to enhance to those created by the typical zero correlation assumption. Second, first have done OLS, the weighting matrix must be obtaining that is critical part or component to a productive GMM examination. The condition moment disadvantage is that it restricts or confines the dynamics in the model (Gragg (1983)). GMM is appropriate estimating stimulating addition of the basic unobserved effect model. Also in case of panel data when a model encloses some lagged dependent variables along with an observed effect model. As compare to 2SLS technique the GMM can deliver more specific estimates with additional moment conditions (Wooldridge (2001)). This study utilizes the time series dimensions through the panel unit root tests. Yearly data have been taken to test the endogeneity of money supply and for this purpose different variables have been selected like: total bank credits, monetary aggregates, money multipliers and the fiscal deficit. Later, the estimation techniques of the proposed models have presented i.e. instrumental

variables and GMM estimation. Finally, the parameter testing for the evidence of endogeneity of money supply is discussed briefly, i.e. C-statistics.

3.2.1 The Method of Instrumental Variables

In the context of Classical Linear Regression model, the application of the instrumental variables (IV) estimator, it is quite straightforward in the context of a textbook. This hold: if the independent of regress distribution cannot be considered the error distribution, IV is called for, consuming a suitable set of instruments. Nethermost commonly recognized as a clarification to endogenous regressors.

Despite the fact that Instrumental Variable Estimators address worries or disquiets of endogeneity however the endogeneity regressors caused the violation of the zero-conditional mean assumption and these endogenous regressors can be derived from the other factors. It means the endogeneity regressors caused the assumption which are imposed in the estimated model. The endogeneity regressors which is derived from the other factor; estimated errors in regressor i.e. the errors in variables and biased omitted variables. By the way, derived of infringement of the zero-contingent mean supposition caused by endogenous regressors can likewise be radiated from alternate components; estimation mistake in regressors (blunders in-factors) and discarded variable predisposition. However, Ordinary Least Square (OLS) regression can be excerpted beneath as;

$$Y = X\beta + \mu \tag{3.10}$$

The correlation among the explanatory variable (x) and residuals (μ), which is describe that E [μ_i x] $\neq 0$, can be caused or can be affected by using of any Shanmugal factors, in

this phenomenon the coefficient i.e. β becomes biased when it is used as an instrumental variable least square. The biasness can be proof as under:

$$y = X\beta + \mu \tag{3.11}$$

$$\beta = (X'X)^{-1}X'Y \tag{3.12}$$

By putting the value of Y in equation (3.12)

$$\beta = (X'X)^{-1}X'(X\beta + \mu)$$

$$\beta = (X'X)^{-1}X'X\beta + (X'X)^{-1}X'\mu$$

$$\beta = \beta + (X'X)^{-1}X'\mu \tag{3.13}$$

Finally, the results are biased because $X\mu \neq 0$, so here is problem of endogeneity to remove this problem of endogeneity we use Instrument Variable Least Square...

The equation to be estimated is, in matrix notation,

The above mention equation number (3.13) to be estimated is, in matrix representation,

$$BC = X\beta + \mu, \tag{3.14}$$

$$E(\mu\mu') = \Omega \tag{3.15}$$

With representative row

$$BC_i = XB_i + u_i \tag{3.16}$$

The $n \times K$ is representing the matrix of regressors X, where n symbolizes the total number of observations. This term, u which signifies the error term that is distributed with zero mean and Ω i.e. covariance of matrix $n \times n$. In this way, three unusual cases for Ω which is deliberated in the study these are describes as under:

Homoscedasticity: $\Omega = \sigma^2 I$ (3.17)

Heteroskedasticity: $$\Omega = \begin{bmatrix} \sigma_1^2 & 0 & . & ... & 0 \\ 0 & \sigma_1^2 & . & ... & 0 \\ . & . & . & ... & . \\ . & . & . & \ddots & . \\ 0 & 0 & 0 & ... & \sigma_n^2 \end{bmatrix}$$

There are some parameters or regressors are endogenous, due to this $E(X_i\mu_i) \neq 0$. The above mention study make partition the set of regressors keen on [X_1 X_2], the regressors X_1 with K_1, so the X_1 regressors supposed to be endogenous under the null hypothesis, and the other remaining regressors i.e. (K –K_1) remaining regressors these regressors supposed to be exogenous.

Where the regressors

X = [X_1 X_2] = [X_1 Z_2] = [Endogenous Exogenous] (3.18)

The instruments for solve the problem of endogeneity test:

Instruments Z = [Z_1 Z_2] = [Excluded Included] (3.19)

The order condition for identification of the equation is L ≥ K; there must be at least as many excluded instruments as there are endogenous regressors. If L = K, the equation is said to be "exactly identified"; if L>K, the equation is "overidentified".

Denote by P_Z the projection matrix $Z(Z'Z)^{-1}Z'$. The instrumental variables estimator of β is,

$$\hat{\beta}_{IV} = \{X'Z(Z'Z)^{-1}Z'X\}^{-1}X'Z(Z'Z)^{-1}Z'y = ((X'PZX)^{-1}X'P_{Zy} \quad (3.20)$$

This estimator goes under a variety of names: the instrumental variables (IV) estimator, the generalized instrumental variables estimator (GIVE), or the two-stage least squares (2SLS) estimator, the last reflecting the fact that the estimator can be calculated in a two-step procedure.

Here, let $\hat{\mu}$ represents the Instrumental Variables (IV) residuals,

$$\hat{\mu} = BC - X\hat{\beta}_{IV} \tag{3.21}$$

Then and there, the IV estimator is asymptotically distributed as $\hat{\beta}_{IV} \sim \mathrm{N}\{\beta, \mathrm{V}\ (\hat{\beta}\mathrm{IV})\}$,

Where:

$$V\left(\hat{\beta}_{IV}\right) = \frac{1}{n}\sigma^2 (Q'_{XZ} Q_{ZZ}^{-1} Q_{XZ})^{-1} \tag{3.22}$$

Substituting, Q_{XZ}, Q_{ZZ} and Q^2 with their sample estimates

$$\bar{Q}_{XZ} = \frac{1}{n} X'Z \tag{3.23}$$

$$\bar{Q}_{ZZ} = \frac{1}{n} Z'Z \tag{3.24}$$

$$\hat{\sigma}^2 = \frac{\hat{\mu}'\hat{\mu}}{n} \tag{3.25}$$

We acquire the estimated asymptotic variance and covariance matrix of the IV estimator:

$$V\ (\hat{\beta}_{IV}) = \hat{\sigma}^2\{X'Z\ (Z'Z)\ - 1Z'X\}^{-1} = \hat{\sigma}^2 (X'PZ\ X)^{-1} \tag{3.26}$$

3.2.2 The Generalized Method of Moments (GMM)

The Generalized method of Moments is describing as: the standard IV estimator is a distinct or a special case of a generalized method of moments (GMM) estimator. The relation of the instrumental variable with error term is zero i.e. $E(Z_i u_i) = 0$, this describe

the assumption which is used for instrumental variable to solve the problem of endogeneity in the model. The set of L-moments describe by the L-moments

$$h_i(\hat{\beta}) = Z_i'\hat{u}_i = Z_i'(y_i - X_i\hat{\beta}) \quad (3.27)$$

Where, hi is $L \times 1$. If there are orthogonality conditions or the L-moments conditions, it means that there is exogeneity of the instrument. Its further we say the exogeneity of the instrument describe the orthogonality or L-moments conditions so, these conditions will be satisfied at the true value of β:

$$E\{h_i(\beta)\} = 0 \quad (3.28)$$

The given L-moments in equations, the each of these equations resembles to a sample moment. The L sample moments can be transcribed as following;

$$\bar{h}(\hat{\beta}) = \frac{1}{n}\sum_{i=1}^{n} Z_i'(y_i - X_i\hat{\beta}) = \frac{1}{n}Z'\hat{u} \quad (3.29)$$

The main purpose or persistence of using or applying GMM is to indicate an estimator for β that solves $\bar{h}(\hat{\beta}) = 0$

The above mention equations, estimating these equations If the condition precisely distinguished or identified, So L = K, in coefficient$\hat{\beta}$, the coefficients K which we do as unknowns, at that moment the L-moment conditions has many equations. From this announcement and condition, it is conceivable to discover a $\hat{\beta}$ that solves $h(\beta) = 0$, and the Instrumental Variable (IV estimator) is in certainty through GMM.

On the other hand, if the above equation is overidentified, in any case, with the goal that L>K, at that point we have a larger number of conditions or equations than we do unknowns, and as a rule it would not be conceivable to discover $\hat{\beta}$ so, this established all

L sample moment conditions to precisely zero or we can say that the $\hat{\beta}$ coefficient will establish the L sample moment conditions accurately zero. In this situation, we take L × L weighting framework W and utilize it to develop a quadratic shape in the form of moment conditions. This procedure provides us the GMM target or objective function which is as under:

$$J(\hat{\beta}) = n\bar{h}(\hat{\beta})'W\bar{h}(\hat{\beta}) \quad (3.30)$$

3.4 Testing of Parameters

We propose a test of overidentifying restrictions, C statistic, to test the endogenous money hypothesis i.e. the money is endogenous. To find the linear relationship among bank credits and monetary aggregate, money multipliers also, with fiscal deficits. Basically, the C-static is test represented by Sargan-in-difference (Sargan (1958)). Through this test, we will check whether there is bidirectional relationship exist or unidirectional amongst total bank credits and monetary aggregates. The main objective is either the money supply is endogenous or exogenous in G-20 economies and South Asian countries, so, for this purpose the C statistic endogeneity test of money can be represented by the following steps:

3.4.1 Linear Relation of Money Supply and Bank Credit

In this section, we are using the Instrumental Variables (IV) regression methods where the variables and monetary aggregates are being used as explanatory variable. On the basis of endogeneity definition, the equation is estimated. For the explanatory variables, the test is defined.

$$LBC_{it} = \beta_0 + \beta_1 LM2_{it} + \varepsilon_{it} \quad (3.31)$$

Through the results of the above mention equation, if the money is endogenous i.e. LM2 so, it describes that the coefficient of β_1 in equation (3.31) is significant. Furthermore, due to significance of coefficients, we can say there is contemporaneous two-way relationship (feedback) between the dependent and explanatory variable.

$$LM2_{it} = \gamma_0 + \gamma_1 LBC_{it} + \epsilon_{it} \quad (3.32)$$

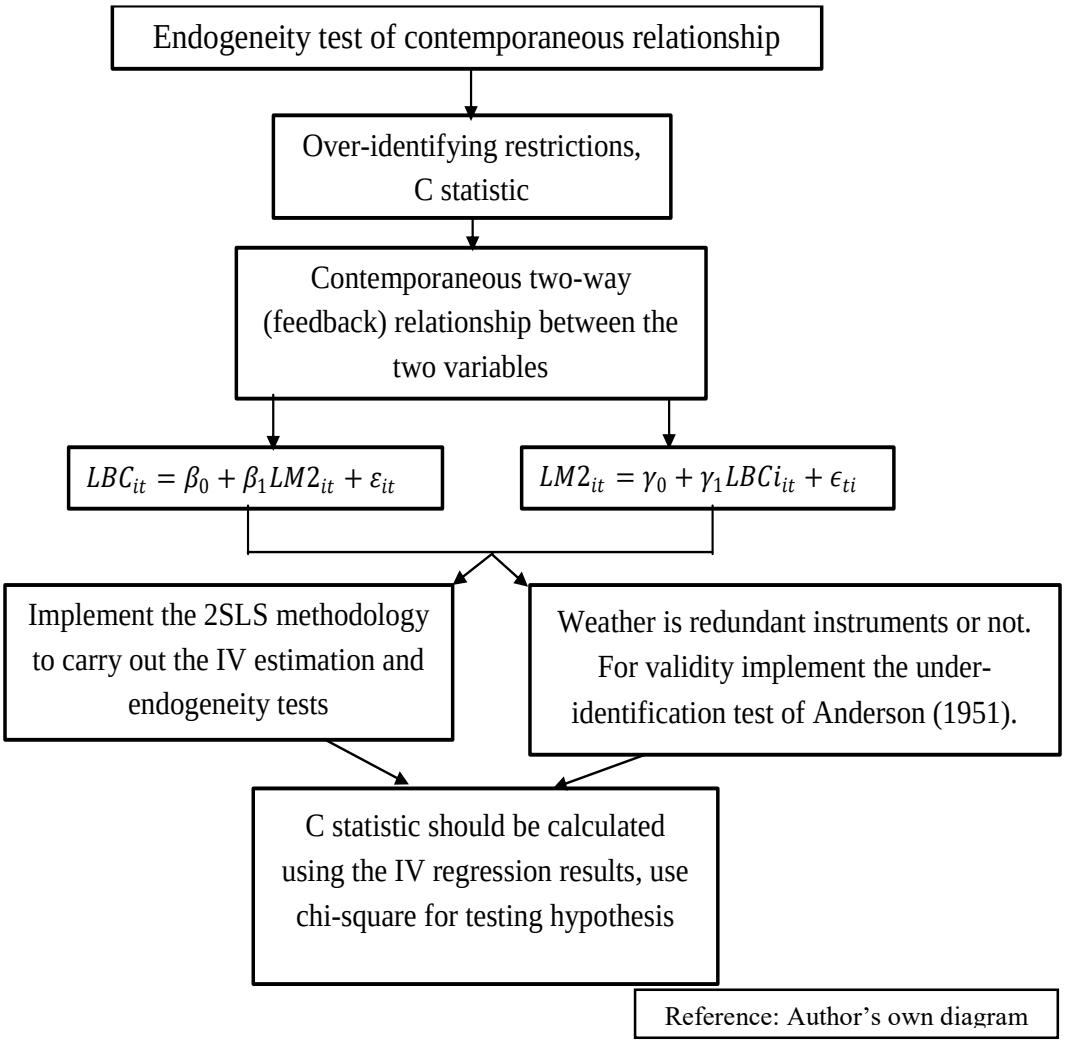
In this study for doing endogeneity tests and instrumental variables estimation we propose or applies the 2SLS (Two Stage Least Square) test. To direct the IV procedure, substantial or valid instruments for LM2t ought to be resolved. In the estimations usually used instrumental variables for lagged values of the dependent variables. For the validity of instruments, the statistics test is applied which is proposed by Sargan (1958). What's more, the investigation is to test whether every single conceivable instrument is being considered by the examination or not. As it were whether there is any repetition in instruments or not? To quantify all instruments are legitimate or valid. In other way, we can say for checking the validity of estimations for all instruments the research proposes the under-identification test which is suggested by Anderson (1951). This test is called LM test which is used to check whether the equation is identified or not? Furthermore, we can say that the instruments are associated with endogenous regressor also we can say the instrument exclude are irrelevant variable.

After this all procedure i.e. IV regression, by applying the IV regression the C-statistics must be calculated. This procedure (C-statistic) on the basis the null hypothesis H_0: the variables is exogenous or on other words, the null hypothesis that the identified endogenous regressor can essentially be preserved as exogenous variable. The c-statistics test basically

distributed as chi-squared. In other words, this follow the chi-squared distribution i.e. the number of regressor tested is equal to with degree of freedom. When the null hypothesis is rejected it implies that the parameter or regressor is endogenous because the null hypothesis is that the regressor is exogenous. Statically the money supply indicators or the monetary aggregate indicators sustenance for the endogeneity of money.

The Summary of Endogeneity Test of Contemporaneous Relationship is depicted as below:

Figure 3. 2:Endogeneity Test of Contemporaneous Relationship



3.4.2 Empirical tests of alternative monetary endogeneity views

As illuminated in the theoretical background, generally the theoretical background about the money supply of endogeneity viewers divided in three parts these are the as follows: The Accommodationist views, Structuralist views and the Liquidity preference views. Testing these three views the IV with 2SLS must be used in the phenomena because these views have different type of hypothesis.

Under the Accommodationist assessments (views) the endogeneity of money reveals the subsequent system of contemporaneous regression equations. Subsequently choosing the valid instruments in the model, the rest of the study in this model estimates the coefficients the following given equations and for monetary aggregates the endogeneity test has implemented.

$$LBC_{it} = \beta_0 + \beta_1(LMB_{it}, LM1_{it}, LM2_{it}) \quad (3.33)$$

As mention above equation, the results of B_1 must be insignificant. If the β_1 is insignificant than we conclude that the Accommodationist view is valid otherwise we conclude it is invalid. Other hand if the coefficient of β_1 is significant than we conclude that the Accommodationist view is invalid so, the arguments are verified i.e. structuralist and liquidity.

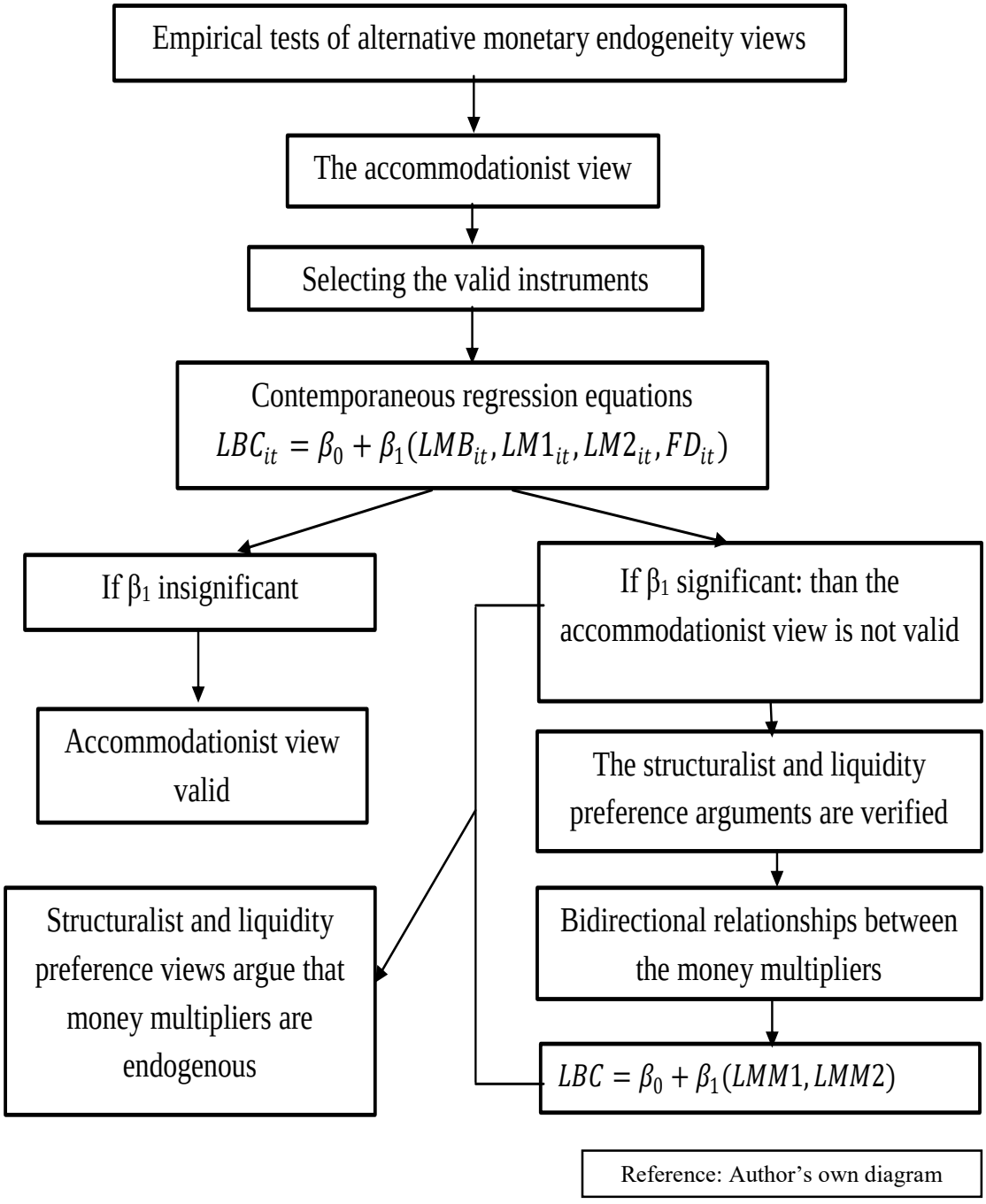
Here, also there is bidirectional relationship among the money multipliers in the case of structuralist and liquidity preference views. On the basis of these results endogeneity of money multipliers (LMM1 and LMM2) must be estimate through the following the equation.

$$LBC_{it} = \beta_0 + \beta_1(LMM1_{it}, LMM2_{it}) \quad (3.34)$$

Through the equation (3.31) the results will suggest whether the money is endogenous or not, further, whether there is bidirectional relationship among the money multipliers and bank credits or not.

The Summary of Empirical Test Monetary Endogeneity Views is shown as below:

Figure 3. 3:Empirical Test of Alternative Monetary Endogeneity



Reference: Author's own diagram

Chapter 4

Data and Variables

4.1 Introduction:

The chapter consists of the stepping stone for the desired analysis of the endogeneity of money. The most recent studies have conducted to test the endogeneity of money that is Tas *et al.* (2012) which are based on time series data on GCC[6] countries and also Badarudin *et al*. (2013) by using time series analysis in G-7 economies with Trivariate VAR and Granger Causality to test the endogeneity of money. Initially, the period of analysis is given and is followed by the region of analysis. Later, the definition of the variables and source of the variables.

Furthermore, we are interested to estimate or explore or to test the endogeneity of money on the basis of three schools of thoughts i.e. i) Accommodationist views (ii) structuralist views (iii) Liquidity Preference theory. For this propose we prefer the C-statistics test the endogeneity of money on 48 countries i.e. G-20 economies and South Asian Countries. However, for this estimation we are using the econometrics techniques the Generalized Method of Moment to calculate or to estimate the C-statistics test, which will identify to test the endogeneity of money whether the money is endogenous or exogenous. The brief details of all subsections are as under:

[6] Gulf Cooperation Council

4.2 Panel data Analysis

In the previous studies, a different type of techniques and data series has been charged, to analyses the endogeneity of money. As Shanmugam *et al.* (2003), Tas et *al*. (2012), Badarudin *et al.* (2013) and another lot of researcher used time series and balance sheet analysis to test the endogeneity of money supply but just a few researchers used panel data analysis. In this study, we are using panel data for estimations because panel data has ability to deal with cross-sectional problems and also with above mention problems.

Through panel data analysis, the other types of data have different types of problem which leads towards biased results but as compare to these data sets panel data has different advantages for analysis. According to Baltagi *et al.* (2005) some important advantages of panel data analysis as under:

(i) Cross-sectional Units

Over the time period the panel data is the combining of cross-sectional components and individually these components are heterogeneous to each other. Among the different units, the individual difference may ascend.

(ii) More Informative Data

The panel data, basically, is the combination of cross-sectional and time series data, so that is why it gives more information about data as compare to other data. The panel data provide more degree of freedom with more efficient parameters, also it provides further variability and less nonlinearity.

(iii) Large Sample Size

The panel data has a large sample size of cross-sectional and time series observations, so, due to this, it provides better results and also it gives unbiased coefficients for making policies.

Keeping in view these advantages we use panel data analysis in G-20 economies and South Asian countries.

4.3 Period of Analysis

The period of analysis, in this study comprising the panel data, is yearly for the analysis of endogenous money reigning over 1980 to 2015. The main purpose of selecting this time period for analysis is a financial crisis in the world wide because most of the financial crisis happened in this period of time.

4.4 Region of Analysis

The Regions who seems to link with each other can be stated as homogeneous panel data and the other areas can be known as heterogeneous. It should also be noted that mooting of Euro gave birth to new demand of money. According to the econometric test regarding the Pre-Economic and Monetary Union (EMU), the data fails to describe any structural unsteadiness in European money demand function, making sure to pose the easy life of European policymakers.

Furthermore, the debates on the endogeneity of money assailed many contradictory results. Endogeneity of money gets analyzed, especially, for the countries that are setting a form of monetary union i.e. Gulf Corporation Council (GCC). According to the study of Tas, *et al.* (2012), where they considered 177 countries and tested the endogeneity of money. Two contradictory views have been presented by the history of modern monetary economics i.e. the role of central bank in handling the money supply and the level of triumph it achieved. In a similar manner, Badarudin, *et al* (2012) tested the same idea by taking a group of seven economies (G-7).

However, our study is based on G-20 economies along with the South Asian Countries like Pakistan. The G-20 economies can be listed as; France, China, Germany, India, Indonesia, Italy, Japan, South Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the United Kingdom and the United States, Argentina, Australia, Brazil, Canada, plus the European Union short for "Group of 20". They are somehow, covering almost 85% of the world's economy and 80% of world trade i.e. covering almost three-quarter of global trade and almost two-third of the world's population.

4.5 Definition and constructions of the Variables:

The definitions and sources of data are given in the given below table:

4.5.1 Total Bank Credits (LTBC)

Bank credit is a type of statement made between the borrower and bank that the borrower would repay the loan along with the stated interest rate. It also shows the total capacity of

lending of any bank. Yet, it does require an exact minimum payment for a specific period. Also, it is the total amount including banking interest rates which is imposed on borrowers. This variable is collected from IFS as the name of total bank credits/ domestic credits in commercial banking. The total bank credits used to manipulate the analysis about the endogeneity of money in different studies like Shanmugam *et al*. (2003), Nayan *et al.* (2013), Badarudin *et al.* (2013) and Tas *et al.* (2012).

4.5.2 Gross Domestic Products (GDP)

GDP is defined as the goods and services produced within the boundaries of an economy in a specific period, it is weighed at current prices. GDP deflator is a method used to convert nominal magnitudes into real magnitudes. GDP is calculated without making findings for depreciation of manufactured resources or for consumption and debasement of natural resources. Dollar figures for GDP are changed over from domestic currencies standards utilizing single year official exchange rates. The Gross Domestic Product used in previous literature as variables in the following studies: Badarudin *et al.* (2013), Nayan *et al.* (2013) and Tas *et al.* (2012).

4.5.3 Monetary Base (MB)

The monetary base is the currency held either in the hands of public or in the depository of banks. However, traditionally speaking monetary base equals to the current bank reserves added to liquid currency, whereas, liquid currency is the currency held in hands. Shanmugam *et al*. (2003) monetary base variable has in-cooperated in their study about

endogenous of money. Also, Badarudin *et al.* (2013), Tas *et al.* (2012) and Nayan *et al.* (2013) they proposed monetary base variables.

MB = R + C. Liquid currency is the amount of money at hand, and bank reserves are money in the banks.

4.5.4 M1 (Money supply)

M1 (money supply), it is the most liquid parts of the money supply which are measured by M1 since it holds currency in circulation and assets that can be changed over to money rapidly. M1 is used as medium of exchange including demand deposits and checking accounts. It is the most commonly as medium of exchange and M1 is defined most narrowly of all component of the money supply. It does exclude financial assets like saving accounts etc.

M1= currency in circulation+ demand deposits and traveler's checks, this variable defined as money from IFS. The monetary variable M1 has been incorporated in this study by Tas *et al.* (2012).

4.5.5 M2 (Money Supply)

M2 (Money Supply) is includes all elements of M1 as well as it includes saving deposits, mutual funds, securities of money markets and other time deposits. These mention elements are less liquid or easily not convertible in liquid for as medium of exchange. As compare to M1 it is can be quickly transform checking deposits or cash. It can be further explained as below:

M2= M1+ time deposits and savings, also it includes certificates of deposits plus money market functions. This variable collected from IFS as Money plus Quasi Money. The M1 (Money plus Quasi-money) has been used in the different article to investigate the endogenous of money supply as Nayan *et al.* (2013), Badarudin *et al.* (2013) and Tas *et al.* (2012).

4.5.6 Money Multipliers (LMM)

It is the expansion or increase in money supply of a country which give results banks being able to offer loan. Furthermore, money which is used to create more money that is calculated by total bank deposits divided by reserve requirement. On the other words, it is the response of money supply for a given change in Monetary Base. It can be calculating as follow:

MM1=M1/MB and MM2=M2/MB. In previous literature, Badarudin *et al.* (2013) and Tas *et al.* (2012) have used money multipliers as a variable in their study. Money multiplier indicates when multiple of the monetary base is transformed into the money supply.

4.5.7 Fiscal Deficit (FD)

A Fiscal deficit is when the government spending exceeds its revenues excluding the borrowing made by the government. The fiscal deficit in previous literature has not been used as a variable to test the endogeneity of money. The fiscal deficit variables constructed is as given below:

Fiscal Deficit= Total Expenditure-Total Revenue (Excluding borrowings)

4.6 Source of Data

The source of data for 8 variables including G-20 Economies and South Asian Countries[7] are given as under:

IFS: International Financial Statistical (International Monetary Fund). For analysis, the data has collected from most recent version of IFS i.e. IFS Feb-2017. The following variables collected through the IFS: Total Bank Credits, Monetary Aggregates (M1, M2, and MB)

The second source is WDI: World Development Indicator (World Bank). The modified data may-2017 of WDI. Gross Domestic Products is collected from WDI.

4.7 Technique for missing Values in Variables

In panel data when we start collecting the 48 countries data of different variables for estimations. We face the problem of missing data with in the series and outside the series so, to compile or solve this problem we propose econometrics technique to fill these missing values.

There is an assortment of methods available for interpolation and extrapolation. These two techniques have names that are fundamentally the same as. Our main propose is just not to fulfill the missing values but also predict the specific and authentic values in the model. We will look at the contrasts between these two techniques:

[7] Appendix A, Page No: 80

The two procedures have been used to fill the missing values of the series. The both techniques are given as below:

i) Extrapolation Method:

To fill the missing values from the variable or series which are missing beyond the known series. In other words, we can say that we want to predict those missing values which are not available outside the series of data.

ii) Interpolation Method

We use the function to estimate through different techniques to fill the data gap which is missed in the middle of the series. In other words, we can say that using the function to predict the values that are missed or not available between know observations.

Chapter 5:

Empirical Results and Discussions

The prime focus of present study is to explore endogeneity of money keeping in view post-Keynesian school of thoughts. The PK school of thought endogeneity of money i.e. accommodationist view, structuralist view, and the liquidity preference view. To undertake this study, we have used data from 48 countries. These countries are selected from the region of G-20 economies and the South Asian countries. We employed Generalized Method of Moment (GMM) and C-statistics technique to check the endogeneity of money in the selected countries.

In the following section, first we estimate the GMM model where the dependent variable total bank credits and independent variables are monetary aggregates are used in separate models. Table 5.1 representing the models of linear relation of money supply and bank credits. Table 5.2 demonstrating linear relationship money supply, fiscal deficit and bank credits. Table 5.3 describing the results of models which representing the linear relationship between money supply and gross domestic products. The final table 5.4 representing the models of linear relationship between money and supply, fiscal deficit and gross domestic products. The following results are as under:

5.1 Linear Relation of Money Supply and Bank Credit

Table 5.1 displays the results of dynamic panel data Generalized Method of Moment (GMM). In model 1 statistically, the coefficient of MB shows that monetary base positively and significantly affects the total bank credits, the coefficient of the monetary base is significant at 95% of the confidence interval. The statistical results indicate if we change the monetary base by one percent then there will be on average 0.15% change in total bank credits. As compare to model 1 LMB, the other models like LM1 and LM2.

Table 5. 1: Dynamic Panel estimation, one-step system GMM

Dependent Variable: Total bank Credits (LBC)					
	Model 1	***Model 2***	***Model 3***	***Model 4***	***Model 5***
LMB	0.15508**	--	--	--	--
	(3.96)	--	--	--	--
LM1	--	0.43297**	--	--	--
	--	(2.85)	--	--	--
LM2	--	--	0.30879**	--	--
	--	--	(3.11)	--	--
LMM1	--	--	--	0.20391	--
	--	--	--	(0.411)	--
LMM2	--	--	--	--	0.19579
	--	--	--	--	(0.268)
Diagnostics					
Sargan	25.31	29.08	40.24	49.70**	70.66***
	[0.793]	[0.615]	[0.150]	[0.024]	[0.000]
AR (2)	1.27	1.01	1.29	1.03	0.97
	[0.204]	[0.311]	[0.197]	[0.301]	[0.332]
C-Stat	0.793**	3.32**	7.57***	0.000	3.25*
	[0.066]	[0.069]	[0.006]	[0.991]	[0.071]

Note: the parenthesis ( ) include t-stat and [ ] includes the p-value of that specific estimate.

***, ** and * indicate the 1%, 5% and 10 % level of significance respectively.

The model's coefficients of LM1 and LM2, statistically are highly significant at 95% of the confidence interval. The elaboration of this will be, one percent change in LM1 and LM2 will bring on average 0.30% and 0.43% changes respectively in total banks credits. The coefficients of LMB, LM1, and LM2 are significant implies that the accommodationist view is not valid so, it means both theories are certified i.e. structuralist and liquidity preference. These results describe structuralist and liquidity preference views of monetary theories are valid. It is found that there is a two-way relationship between bank credits and monetary aggregate and it also implies that central bank can affect the aggregate demand and supply of credit. Under the liquidity preference theory, the results of LMB, LM1, and LM2 implies that the bidirectional relationship exist between bank credits and monetary aggregates. Theoretically, it means that commercial bank channels creating the loans which are affecting the money supply.

Furthermore, statistical results of the coefficients of money multipliers. i.e. LMM1 and LMM2 are insignificant and infers that the accommodationist view is valid. It means a change of one percent in money multipliers will lead to change in the total bank credits. According to the accommodationist's school of thought, interest rate is determinant by the central bank and the commercial banks set their loans rate as a markup over the overnight[8] interest rates by following interest rate of central bank. In addition, for bank loans the

[8] It is the interest rate at which the vast majority of the money related organizations (financial Institution) acquire and loan one-day (short run) funds amongst together or themselves; the Bank built up an objective level for that rate. This objective for the overnight rate is frequently alluded to as the Bank's arrangement loan fee.

commercial banks attempt to meet all demands so, it implies by the demand for bank loans the money supply is determined.

In above table 5.1, the probability value of model 1 of Sargan test is greater than 5% of bench mark as a result, we are not rejecting the joint null hypothesis i.e. instruments are valid. It describes that model has valid instrument which explain variations in the log of bank credits. Moreover, The Sargan values of model 2 and model 3 are greater than the 5% which implies that instrumental variables are lawful. On the other hand, money multipliers of Sargan value of model 4 and model 5 are less than the 5%, it means instruments of money multipliers are not effective or valid. Finally, the statistical results of Sargan test imply, using the instrumental variables of model 1, model 2 and model 3 are valid but on the other hand, monetary multipliers having invalid instruments.

The null hypothesis of Arellano-Bond (1991) test is that there is no autocorrelation in the model and it functions on differenced errors of the model. The above mention table 5.1 results, the value of AR (2) of model 1 is 0.204, which is greater than 5% bench mark. It described there is no autocorrelation in the model 1. Overall, under the statistical results, there is no problem of autocorrelation in monetary aggregates (LMB, LM1, and LM2) and money multipliers (lMM1, LMM2).

The results of C-statistic i.e. difference-in-Hansen statistics. Under the null hypothesis endogeneity of money is that quantified variable or regressors preserved as exogenous. The results of model one suggests that monetary base is statically endogenous because the probability value of model 1 is 0.066 which is less than the 5% of bench mark. So, we are rejecting the null hypothesis i.e. the monetary base is exogenous. Statistically, the other

models (model, model 2 and model 3) are significant at 5%, 10% bench mark, it means we are rejecting the null hypothesis except for model 4. As a result, it implies monetary aggregates and money multipliers are endogenous and also there exists endogeneity of money. According to these findings we conclude that there is bidirectional relationship exist between the monetary aggregates and money multiplier (LMM2).

As in previous literature Badarudin *et al.* (2013), they also found the liquidity preference opinion support the idea that there is a bidirectional relationship between the monetary aggregates and bank credits in Gulf Cooperation Countries (GCC). Also, a feedback relationship or mechanism exists among the money multipliers and total bank credits (Nayan *et al.* (2013)).

In the above mention table 5.1, results are supporting the idea of liquidity preference theory and structuralist view. The results also empirically define that monetary aggregates and money multipliers are following structuralist and liquidity preference school of thoughts except for the LMM1. These findings statistically validate the theory of structuralists and the liquidity preference view that there is bidirectional relationship exist between bank credits and monetary aggregates with money multipliers (LMM1) in G-20 economies and south Asian countries. Empirically, these results do not validate the accommodationist's views.

5.2 Linear Relation of Money Supply, Bank Credit, and Fiscal Deficit

The table 5.2 exhibitions the results of dynamic panel data estimations GMM. The coefficient of Monetary Base β_1 is 0.1616294 and the t-statistics is 4.16, which shows that monetary base positively and significantly affect the total bank credit. If there is one percent change in the monetary base than there will be on average 0.16% change in total bank credits.

Table 5. 2: Dynamic panel-data estimation, one-step system GMM

Dependent Variable: Total Bank Credits (LBC)					
Variables	***Model 6***	***Model 7***	***Model 8***	***Model 9***	***Model 10***
LMB	0.16162**	--	--	--	--
	(4.16)	--	--	--	--
LM1	--	0.43680**	--	--	--
	--	(2.85)	--	--	--
LM2	--	--	0.28638**	--	--
	--	--	(2.95)	--	--
LMM1	--	--	--	0.26197	--
	--	--	--	(0.90)	--
LMM2	--	--	--	--	0.27483
	--	--	--	--	(1.35)
FD	0.01127*	0.00434	0.02381**	0.01040	0.02118
	(1.71)	(0.523)	(3.51)	(1.01)	(1.41)
Diagnostics					
Sargan	24.88	28.29	37.75	47.62**	64.02***
	[0.773]	[0.606]	[0.188]	[0.029]	[0.000]
AR (2)	1.25	1.01	1.27	1.03	0.95
	[0.21]	[0.311]	[0.206]	[0.303]	[0.334]
C-Stat	43.21*	5.63**	3.76**	0.1	2.53
	[0.071]	[0.018]	[0.053]	[0.747]	[0.111]

Note: the parenthesis ( ) include t-stat and [ ] includes the p-value of that specific estimate.

***, ** and * indicate the 1%, 5% and 10 % level of significance respectively.

Further, model 7 and 8 results define, the coefficients of LM1 and LM2 are highly significant at 95% confidence interval. If we change one percent in LM1 and LM2 respectively there will be on average 0.43% and 0.28% changes in total banks credits. The coefficients of LMB, LM1, and LM2 are significant, it implies that accommodationist view is invalid. It elaborates that the structuralist and liquidity preference theories are certified.

We introduced fiscal deficit with monetary aggregates and money multipliers to check contemporaneous relationship with bank credits. The coefficient of fiscal deficits (FD) is positively significant. If one percent change occurs in FD, there will be on average 0.01% change in total bank credits.

Respectively, FD is also positively significant in model 8 with LM2 but it is insignificant in model 7, 9 and 10 with money multipliers as well as LM1. These results described that the structuralist and liquidity preference views of monetary theories are valid. It is found that there is a two-way relationship between bank credits and monetary aggregate. It also implies the central bank can affect the aggregate demand and supply of credit. On the behalf of liquidity preference theory, the results of LMB, LM1, and LM2 implies that there is bidirectional relationship occur between bank credits and monetary aggregates. Theoretically it means, the commercial bank channels are creating the loan which affecting the money supply.

Further, the statistical results of model 9 and 10. i.e. LMM1 and LMM2 are insignificant it elaborates the accommodationist view is valid. According to the accommodationist's school of thoughts the interest is determined through central bank and commercial banks set their loans. owing to interest rate set central bank, the commercial banks attempts to

meet all demands for bank loans, it implies the money supply is determined by the demand for bank loans.

On the above table 5.2, in model 6 the probability value of Sargan test is greater than 5% of bench mark. As a result, we do not reject the joint null hypothesis. i.e. the instruments not invalid. It describes that model 6 has a valid instrument that explains variations in the log of bank credits. Furthermore, in model 7 and 8 the probability values of Sargan test is greater than the 5% which implies that the instrumental variables are valid. In model 9 and 10 the probability values are less than 5%. It means instruments are invalid. Finally, the statistical results of Sargan test denotes that using the instrumental variables the model 6, 7 and 8 having valid instruments. Besides, model 9 and 10 having invalid instruments.

Table 5.2, the results of Arellano-Bond test in model 6 describes that there is no autocorrelation in the model. The probability value of AR (2) of model 6 is 0.21, which is greater than the 5% bench mark. It describes that there is no autocorrelation in the model. Under the overall statistical results, there is no problem of autocorrelation in the above mention models (model 6 to 10).

The results of C-statistics null hypothesis i.e. the variables are exogenous. The results of model six propose that monetary base is statically endogenous because the probability value of c-static in model 6 is 0.071/. which is less than the 10% of bench mark, so we reject the null hypothesis. The results suggest that the monetary base is endogenous.

Statistically, the other model 7, 8, 9 and 1 are rejecting the null hypothesis at 5% bench mark, it means the money aggregates are endogenous as well as fiscal deficit also endogenous and except of money multipliers. The previous studies about the endogeneity

of money Gedeon (2009) investigated the endogeneity of money in currency board establishment of Bosnia and Herzegovina. She concluded that the growth of money supply is affected by liquidity needs of the bank not the external trade outcome, also she confirmed that the money supply is endogenous. For different economies in experimental writing on the endogeneity of money has demonstrated the money supply determined endogenously through the commercial banks and the financial markets Nell (2001), Shanmugam et al. (2003), and Vera (2001).

According to these results, it implies the monetary aggregates and fiscal deficits are endogenous throughout the countries taken in the study i.e. G-20 economies and South Asian countries. Also, these findings suggest a bidirectional relationship between the monetary aggregates and BC (bank credits) and there is also bidirectional relationship between fiscal deficits with BC. Empirically, results define that the monetary aggregates are following the structuralist and liquidity preference school of thought except for money multipliers. If a country has a large fiscal deficit, money supply will be endogenous as a result the fiscal deficits certified that the money supply is endogenous in G-20 economies and south Asian countries.

According to Pollin (1991) many macroeconomics models-new Keynesian, new classical, neoclassical and monetarists idea rejected by post-Keynesian. Post-Keynesian claims the money supply has a significant effect. This suggests the credit supply through commercial banks are not as in effect as deliberated in the literature. Finally, on the basis of these findings statistically validate the post-Keynesian theory (structuralist and the liquidity preference view), there is a bidirectional relationship between the monetary aggregates and Bank credits because the commercial banks creating credit. That is why, the endogeneity

of money exists. On the other hand, it also found a bidirectional relationship among the Fiscal deficits and the total bank credits in G-20 economies and South Asian countries but empirically, these results do not validate the accommodationist's views.

5.3 Linear Relation of Money Supply and Gross Domestic Products

The following table 5.3 outlines the results of five model. The models represent the linear relation of money supply and gross domestic products.

Table 5.3 presents the coefficient of Monetary Base β_1 is 0.00056 and the t-states is 0.33 which shows that monetary base is insignificant. Statically, LM1 coefficient is negatively significant at 95% confidence interval, it means if we change one percent in LM1 it will affect LGDP by 0.003%. The LM1 is negative impact on Gross Domestic Products. The coefficients of LM2 is insignificant towards Gross Domestic Production. Comparatively, the LMM1 and LMM2 are negatively significant at 95% of confidence interval. These money multipliers result render that money multipliers having negative impact on money income (LGDP) of G-20 economies and south Asian countries.

The statistical results of LMB and LM2 implies that the accommodationist view is valid so, theoretically, it means the monetary aggregates (LMB, LM2) having two-way feedback between the monetary aggregates and income. In model 12, 14 and 15, monetary aggregate (LM1) and money multipliers are significant, it refers structuralist and liquidity preference theories are certified.

Table 5. 3:Dynamic panel-data estimations, one-step system GMM

Dependent Variable: Gross domestic Products (LGDP)					
Variables	***Model 11***	***Model 12***	***Model 13***	***Model 14***	***Model 15***
Constant	0.09460**	0.02442	0.09391	0.27761**	0.18650**
	(2.0)	(0.57)	(0.81)	(5.47)	(3.87)
LMB	0.00056	--	--	--	--
	(0.33)	--	--	--	--
LM1	--	-0.0033**	--	--	--
	--	(-1.92)	--	--	--
LM2	--	--	0.00029	--	--
	--	--	(0.18)	--	--
LMM1	--	--	--	-0.00509**	--
	--	--	--	(-2.60)	--
LMM2	--	--	--	--	-0.00271**
	--	--	--	--	(-1.99)
Diagnostic					
Sargan	343.47***	317.63***	297.02***	336.06***	298.24***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AR (2)	-0.55	-0.13	0.22	-0.56	-0.8
	[0.581]	[0.896]	[0.828]	[0.579]	[0.425]
C-Stat	12.34***	6.06***	5.56***	2.68	0.14
	[0.000]	[0.000]	[0.018]	[0.102]	[0.71]

Note: the parenthesis ( ) include t-stat and [ ] includes the p-value of that specific estimate.

***, ** and * indicate the 1%, 5% and 10 % level of significance respectively.

These significance results of model 12, 14 1nd 15 suggest that there is a feedback relationship among the money income (LGDP) and monetary aggregates and also, there is feedback relationship exist between money multipliers and LGDP, these can be contingent to the liquidity preference. On the basis of these models results, the structuralist views and liquidity preference of monetary theories are valid. It is found that on the basis of structuralist view there is a two-way relationship between money income and monetary aggregate (LM1).

The output of above table 5.3 shows that the probability value of model 11 in Sargan test is greater than 5% of bench mark as results do not reject the joint null hypothesis. i.e. the instruments are not valid it describes that monetary base is not a valid instrument. The Sargan values of model 12 and 13 are greater than the 5% which implies that the instrumental variables are not valid and also the 13 and 14 greater than 5%. It means the instruments are not valid. Thus, the statistical results of Sargan test imply that using the instrumental variables of monetary aggregates and LMB) and money multipliers are invalid instruments.

The value of AR (2) of model 11 is 0.581, which is greater than the 5% bench mark it describes there is no autocorrelation in the model. Overall, under the statistical results, there is no problem of autocorrelation in monetary aggregates models and money multipliers models.

The C-statistic null hypothesis is that the variables are exogenous. The results of model eleven propose that monetary base is statistically endogenous because the probability value of LMB is 0.000, which is less than the 5% of bench mark. We reject the null hypothesis i.e. The monetary base is exogenous. Statistically, the other model 12 and 13 C-statistic result are also rejecting the null hypothesis at 5% bench mark except for money multipliers (model 14 and 15). As a result, it implies that the endogeneity of money exists between monetary aggregates income. Thus, there is causality between the monetary aggregates and income (GDP). In previous studies, the accommodationist point of view suggests bidirectional causality amongst the income (LGNP) and the M3 i.e. money supply (LM3) (Moore, 1989).

Moreover, in the previous studies found that on the connection among the income (LGNP) and M3 i.e. money supply (LM3), the structuralist school of thought concurs with the accommodationist approach which suggests a bidirectional causality between the two variables i.e. M3 and (LNGP). Structuralist view stresses the utilization of risk (liability) administration to overcome the deficiencies which occur shortly (Palley, (1994)). According to these findings we conclude, there is a bidirectional relationship between money income (LGDP) and monetary aggregates.

Furthermore, the results also empirically define that the monetary aggregates are following the accommodationist views. The other variables of monetary aggregate (LM1) and money multipliers are following the structuralist and liquidity preference school of thought. The projected endogeneity of money test validates the theory of structuralists and the liquidity preference views that there is a bidirectional relationship between the monetary aggregates and money income in G-20 economies and South Asian countries.

5.4 Linear Relation of Money Supply, Gross domestic Products, and Fiscal Deficit

The below-given table 5.4 exhibitions the results of dynamic. The coefficient of Monetary Base β_1 is 0.0021 and the t-states is 2.94 which displays that monetary base positively significant.

The monetary base has positive effect on money income (Gross domestic Productions). If there is one percent change in the monetary base, there will be on average 0.003% change in money income (LGDP) as compared to the other models like LM1 and LM2 are

insignificant. The both models LM1 and LM2 coefficients statically are significant at 95% confidence interval it means if we change one percent in LM1 and LM2 respectively, there will not be 0.001%, 0.003% changes in LGDP. The money multipliers are also significant. The coefficient of LMB in model 16 is significant.

Table 5. 4:Dynamic panel-data estimation, one-step system GMM

Dependent Variable: Gross Domestic Products (LGDP)					
Variables	***Model 16***	***Model 17***	***Model 18***	***Model 19***	***Model 20***
Constant	0.16761**	0.11148**	0.11818**	0.44509**	0.23082**
	(2.94)	(1.86)	(2.10)	(7.83)	(4.30)
LMB	0.00214*	--	--	--	--
	(1.18)	--	--	--	--
LM1	--	-0.0018	--	--	--
	--	(-0.79)	--	--	--
LM2	--	--	0.00048	--	--
	--	--	(0.30)	--	--
LMM1	--	--	--	-0.0168**	--
	--	--	--	(-6.03)	--
LMM2	--	--	--	--	-0.0037**
	--	--	--	--	(-2.11)
FD	0.0007*	0.0006**	0.0003	0.0017***	0.0004**
	(2.24)	(2.07)	(1.09)	(5.83)	(1.81)
Diagnostic					
Sargan	348.58***	318.12***	296.4***	328.04***	300.1***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AR (2)	-0.44	0.02	0.32	-0.47	-0.74
	[0.663]	[0.987]	[0.75]	[0.63]	[0.457]
C-Stat	17.06***	5.63***	5.43***	9.88***	0.02
	[0.000]	[0.01]	[0.02]	[0.02]	[0.88]

Note: the parenthesis ( ) include t-stat and [ ] includes the p-value of that specific estimate.

***, ** and * indicate the 1%, 5% and 10 % level of significance respectively.

It implies, accommodationist view being certified that it is not valid thus, the structuralist and liquidity preference theories are certified. Shanmugam (2003) in previous studies he suggests that there is long-run bidirectional causality among money supply and the income

(LGDP) using the fiscal deficit as explanatory variable with monetary aggregates and money multipliers.

In model 16, the fiscal deficits (FD) is positively significant at 10% of bench marks it implies that if one percent change in FD, there will be on average 0.0007% change in money income (LGDP). Respectively, the FD also positively significant at 5% of bench marks in the model 17 with LM1 and with money multipliers (model 19 and 20). FD is insignificant in model 18 with LM2. These results suggest that structuralist views and liquidity preference of monetary theories are valid. It is found that there is a two-way relationship between income (LGDP) and monetary aggregate.

On the above table 5.4, the probability values of monetary aggregates (model 16 to model 18) and money multipliers (model 19 and 20) in Sargan test is less than 5% of bench marks. As a result, we reject the joint null hypothesis. i.e. the instruments are not valid. Thus, the instrument is used in the models are invalid instruments.

The null hypothesis of Arellano-Bond test is that no autocorrelation in the model. The value of AR (2) in model 16 is 0.21, which is greater than the 5% bench mark. It described there is no autocorrelation in the model. Overall, under the statistical results, there is no problem of autocorrelation in monetary aggregates (model 16 to 18) and money multipliers (model 19 and 20).

The results of C-statistics null hypothesis of endogeneity of money is that the variables are exogenous. The results of model sixteen propose that monetary base is statically endogenous because the probability value of LM1 is 0.000 which is less than the 1% of bench mark. We reject the null hypothesis conclude the monetary base is endogenous.

Statistically, model 17, 18, and 19 are rejecting the null hypothesis at 5% bench mark, except the model 15. As a result, it implies that the monetary aggregates and fiscal deficits are endogenous.

According to these findings we conclude, there is a bidirectional relationship between the monetary aggregates and fiscal deficit. The results also empirically define that the monetary aggregates are following the structuralist and liquidity preference school of thought except for money multipliers. If a country has a large fiscal deficit there money supply will be endogenous as a result the fiscal deficits results certified that the money supply is endogenous in all countries (G-20 economies and south Asian countries). These findings statistically validate the theory of structuralists and the liquidity preference view that there is a bidirectional relationship between the monetary aggregates and Fiscal deficits in all countries (G-20 economies and South Asian countries) but empirically, these results do not validate the accommodationist's views.

5.5 Conclusion

On the basis of these discussed we conclude that the structuralist views and liquidity preference of monetary theories are valid. The results support structuralist view, it means there is a two-way relationship between bank credits and monetary aggregate, and also the central bank can affect the supply of credit and aggregate demand. Under the liquidity preference theory, we accomplish that between bank credits and monetary aggregates a bidirectional relationship exist. It means theoretically, the commercial bank channels creating the loans which are affecting the money supply. The FD also positively significant with LM2 but it is insignificant with money multipliers as well as money supply (LM1).

On the basis of these analyses, the structuralist views and liquidity preference of monetary theories are valid. Also, it implies the central bank can affect the supply of credit and aggregate demand. Under the liquidity preference theory, the results of LMB, LM1, and LM2 implies that there is a bidirectional relationship between bank credits and monetary aggregates. It means theoretically, the commercial bank channels creating the loan which affecting the money supply.

The statistical results refer that the accommodationist view is valid. It describes the monetary aggregates (LMB, LM2), there is two-way feedback between the monetary aggregates and income. The monetary aggregate (lM1) and money multipliers (LMM1, LMM2) are supporting the structuralist and liquidity preference theories. It describes there is a feedback relationship among the monetary aggregate and money income (LGDP) as well as between money multipliers and money income (LGDP). The structuralist views and liquidity preference of monetary theories are valid. It is found that on the basis of structuralist view there is a two-way relationship between income and monetary aggregate (LM1).

To endogeneity test of money through C-statistics, we found that the monetary aggregates and money multipliers are endogenous and also endogeneity of money exists and there is a bidirectional relationship between the monetary aggregates and money multipliers (LMM2). Empirically, the monetary aggregates and money multipliers are following the structuralist and liquidity preference school of thought except for the LMM1. The monetary aggregates and fiscal deficits are endogenous throughout all countries (G-20 economies and South Asian countries) and also, there is a bidirectional relationship between the monetary aggregates and BC (bank credits) and also there is a bidirectional relationship

between fiscal deficits with BC. On the other hand, there is also found a bidirectional relationship between the fiscal deficits and the total bank credits in all countries (G-20 economies and South Asian countries) but empirically, these results do not validate the accommodationist's views.

Moreover, we conclude that endogeneity exist in the monetary aggregates, there is bidirectional relationship between the monetary aggregates and gross domestic products (LGDP). These findings statistically validate the theory of structuralists and the liquidity preference view that there is a bidirectional relationship between the monetary aggregates and Money multipliers in all countries (G-20 economies and South Asian countries). Furthermore, the monetary aggregates and fiscal deficits are endogenous and there is a bidirectional relationship between the monetary aggregates and fiscal deficit. The monetary aggregates are following the structuralist and liquidity preference school of thought except for money multipliers. These statistical findings also validate the theory of structuralists and the liquidity preference view but empirically, these results do not validate the accommodationist's views.

Chapter: 6

Conclusions and Recommendations

This study we propose to test the endogeneity of money on the basis of the post-Keynesian school of thoughts i.e. Accommodationist views, structuralist's views and the third is liquidity preference theory. The main objective of this study to test the endogeneity of money supply for the selected panel of countries i.e. G-20 economies and South Asian Countries. Also, to check the robustness of the contemporaneous relationship between money supply and bank credits. To meet these mention objectives, we proposed well established and specific econometrics techniques. For testing the endogeneity of money supply the econometrics methods Generalized Method of Movement (GMM) and C-statistics have incorporated. Moreover, we used panel data for selected regions from 1980 to 2015 with some more appropriate variables are as follows: Total banks credits, Gross domestic products, fiscal deficit, monetary aggregates and money multipliers.

The gist of our findings suggests these following results which are as follows: the bank credits with monetary aggregates verified the accommodationist view is not valid and the structuralist and liquidity preference theories are valid. The discoveries are consisting with Post-Keynesian hypothesis i.e. money supply is endogenous and also the findings are supporting the Post-Keynesian school of thoughts. It elaborates, there is two-way relationship between bank credits and monetary aggregates. The central bank can affect the supply of credit and aggregate demand and commercial banks channels creating the loans which are affecting the money supply. The gist of the discussion is that the monetary

aggregates and money multipliers are endogenous and also there exists endogeneity of money in G-20 economies including the Asian countries. Empirically, the monetary aggregates and money multipliers are following the structuralist and liquidity preference school of thoughts. These findings support Badarudin *et al.* (2013) and Howells and Hussein (1998) that the money supply is endogenous. On the other hand, money multipliers are varifieng the accommodationsit views that there is two-way relationship among the money multipliers and bank credits. The results from banks being able to lend because the money multipliers effect is the increase of money supply.

It is found that there is a two-way relationship between fiscal deficit and bank credits because the results of fiscal deficits are supporting the structuralist and liquidity preference views. On the other side, the money multipliers are supporting the accommodationist's school of thought the interest determined by the central bank the commercial banks set their loans rate due to central bank's interest rate and the commercial bank's attempts to meet all demands for bank loans. It implies money supply is determined by the demand for bank loans. The findings suggest that the post-Keynesian school of thought has certified that the money is endogenous. There is a contemporanous relationship between the monetary aggregates and Bank credits because the commercial banks creating credits; that is why, the endogeneity of money supply propositionally increasing in G-20 economies and South Asian countries.

Our cautiously measured findings have significant implication. The findings of linear relationship among gross domestic products and monetary aggregates are recommend that money multipliers having a negative impact on money income of G-20 economies and south Asian countries. Monetary aggregates provide that there is two-way feedback

between the monetary aggregates and money income. Moreover, the results also empirically define that the monetary aggregates are following the structuralist and liquidity preference school of thought except for money multipliers. If a country has a large fiscal deficit, the money supply will be endogenous as a result the fiscal deficits results certified that the money supply is endogenous in all countries G-20 economies and south Asian countries. Furthermore, study termed, a contemporaneous relationship among the money multipliers and money income. These findings support the previous literature as Zaman (2015) suggested that all governments have different mechanism which restrict to print more money to finance expenditure. Governments can increase money by borrowing through issuing treasury bonds but it generates interest based debts. Finally, theses borrowing process creates interest based debt and also increase the money supply through the multiplier effect.

This study empirical finding supports Post-Keynesians theories and theoretical arguments, these finding also provides evidence that the money is endogenous in G-20 economies as well as in south Asian countries. statistically validate there is a bidirectional relationship between the monetary aggregates and Fiscal deficits in all countries (G-20 economies and South Asian countries) but empirically, these results do not validate the accommodationist's views.

6.1 Policy Recommendations

The policy and recommendations on the context of this study is that the current monetary policies implemented in G-20 economies and South Asian countries allows the creation of endogeneity of money supply through the privates and commercial banking systems,

Therefore, the central bank do not obligatory to control money supply. Those countries have more deficits there; the endogeneity of money exist; the economies must control fiscal deficits. The overall empirical analysis supporting the Post-Keynesian theories that the money is endogenous so, the G-20 economies and South Asian countries should not use or implement monetary aggregates and money multipliers as a target for monetary supply after confederation/unification. If the money supply is endogenous in all economies (G-20 and South Asian), formerly the interest rate must be treated as exogenous, because of the money supply endogenous, then interest rate targeting approach would be the appropriate and effective policy for G-20 economies and South Asian countries.

6.2 Further Research

We could not discuss the endogeneity of money supply by using different instruments to direct test endogeneity of money in individual country. In future, the researcher should test the endogeneity of money by introducing new instruments and to test separately for each country for G-20 economies and South Asian countries. Furthermore, the future researcher should include the financial credits that credits which are creating through the financial markets/institutions i.e. speculation credits etc. So, the researcher can test the endogeneity of money including the financial sectors variables.

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Appendix

List of the G-20 Economies and South Asian Countries

Table A.1 The list of Countries	
Argentina	Japan
Australia	Latvia
Austria	Lithuania
Belgium	Luxembourg
Brazil	Maldives.
Bulgaria	Malta
Canada	Mexico
China	Nepal.
Croatia	Poland
Cyprus	Portugal
Czech Republic	Romania
Denmark	Russia
Estonia	Saudi Arabia
Finland	Slovakia
France	Slovenia
Germany	South Africa
Greece	South Korea
Hungary	Spain
India	Sweden
Indonesia	Turkey
Ireland	United Kingdom
Italy	United States
Afghanistan.	Nepal.
Bangladesh	Pakistan.
Bhutan.	Sri Lanka.