INVESTIGATING CAUSES OF INFLATION IN PAKISTAN: INCORPORATING PARADOX OF MONETARY PROFITS

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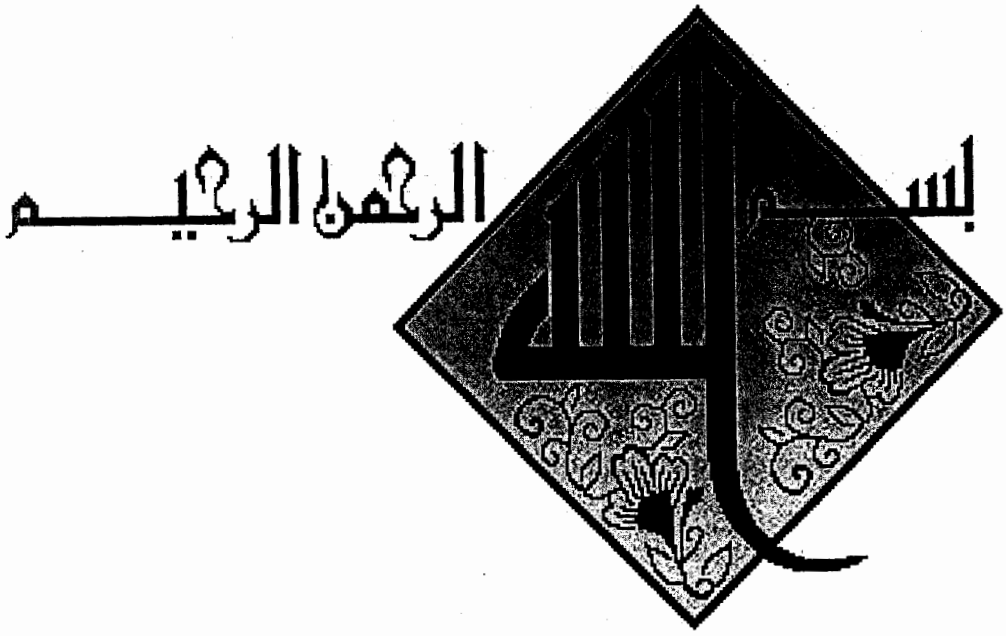

In the Name of

ALLAH

Most Merciful and Compassionate the Most Gracious and Beneficent whose help and guidance we always solicit at every step, at every moment

Investigating Causes of Inflation in Pakistan: Incorporating Paradox of Monetary Profits

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Certificate of Approbation

We accept the work contained in this dissertation as conforming to the required standard for partial fulfillment of the degree of Master of Science in Economics and Finance (MS EF)

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Dedication

To my dearly beloved Parents…

To my beloved Sheikh…

To my Sisters and Wife…

To my Teachers…

To my Friends…

Who Constantly Prayed, Encouraged and Helped.

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List of Abbreviations:

CGS	Credit to Government Sector
CNGS	Credit to Non Government Sector
CPI	Consumer Price Index
DR	SBP Discount Rate
FBS	Federal Bureau of Statistics
IhG	Inherent Gap
IhGT	Inherent Gap Theory
M2	Broad Money
QIM	Quantum Industrial Manufacturing
QTM	Quantity Theory of Money
SBP	State Bank of Pakistan
T Bills	Treasury Bills
TC	Total Credit (Domestic Credit)
TCI	Total Credit plus Interest

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ABSTRACT

Conventional analysis explores the reasons of inflation in the Quantity Theory of Money, which describes the relation between Money and Prices. However, beside the QTM, there is another phenomenon which is responsible for high inflation i.e. the Inherent Gap. When a bank gives loan to a borrower, the borrower has to pay the principal amount plus interest rate, but the existing stock do not have enough money to pay back. This is because the banks create only the principal amount they don't create the interest amount. Any amount of money coming into economy will be again through the banks in shape of debt, which will increase the gap between amount present in the economy and amount to be repaid by the borrowers. This shortfall of money is the Inherent Gap, leaving borrower in very fragile situation, of facing undue pressure – including social pressures – or in extreme conditions faces default\bankruptcy. Role of Inherent Gap as a determinant of inflation is analyzed using the time series data for the time period 2003 to 2011. Numbers of sophisticated econometric techniques, namely Students t-test, Structural Break, Johansen Cointegration and Encompassing, have been utilized to analyze the relation between inflation and Inherent Gap. Evidences strongly support that inherent gap can be one of the key determinant of inflation.

CHAPTER I: INTRODUCTION

Pakistan is facing internal and external problems on the major economic indicators such as, increasing debt, budget deficit, high poverty rate, high unemployment rate and most of all ever increasing inflation rate – to name a few. From 2003 until 2011, the average inflation rate (YoY) in Pakistan was 11.91 percent reaching as high as 25.33 percent in August of 2008 and hovering at about 13 percent in April 2011. The increasing inflation rate keeps on pressing the poor and middle class.

From the orthodox view, inflation theories can be divided into two major schools of thoughts namely demand-pull and cost-push; quantity theory of money and structural factor theory respectively. "The study of inflationary effects stemming from real shocks is closely related to the economics of technology, long-run growth theory, and theory of exchange-rate determination, since they arise in the form of, e.g., negative productivity shocks, stagflationary relative-price shocks related to imported raw materials or depreciations in the domestic currency. But, this is not the whole story. The time path of prices may also be influenced by the expectations, stickiness of prices/wages, and possible indexation experiences in the economy. Therefore, these *inertial* factors should be considered as a third block of explanatory factors of inflation. The last block of explanatory factors of inflation seems to be offered by the new political macroeconomics. To model the dynamics of inflation more realistically, the political process, or the role of institutions, must also be considered explicitly."[1]

[1] Aykut Kibritçioğlu, "Causes of Inflation in Turkey: A Literature Survey with Special Reference to Theories of Inflation", Inflation and Disinflation in Turkey, 2002.

Most of the above cited theories on the causes of inflation implicitly acknowledge a perfect working financial market, running fine on the given necessary rules and regulations. However this is not the case; Hyman Minsky (1992) established theories of financial markets fragility and its role in normal business cycle of an economy, known as 'financial instability hypotheses'. Financial crisis of 2008 brought his theory back in highlights, Mcculley (2009).[2]

The current financial world is based on fiat money or credit money, majorly generated by the banks through fractional reserve banking; also known as money creation or money multiplier. There is a non-orthodox school of thought which advocates that in business for any profit to occur $M' > M$; i.e. the business generates more money than initially invested. Where M is the initial money supply and M′ is more money than initial money supply. But as the money is endogenously determined and enters in the system in form of debt there is no possibility of increment in money supply as per itself. Banks while lending, only create the principal amount and asks in return principal plus interest, whereas they never create the interest money. Thus, giving birth to an inherent shortfall in money supply and giving rise to inability of total repayment from the borrowers including the government deficit which it creates on itself; this phenomena is also known as 'paradox of monetary profits' Smithin (2009), Bruun et. al (2009), Graziani (2003), Greco (1990).

This paradox of monetary profits gives rise to boom and busts in business cycle; as more borrowing or injection of money supply is needed over the time for paying off the debt – exponential increase in money supply – any reduction in rate of borrowing gives rise to a bust situation and slow down of economy, if any flexibility is found in the business cycle then this shortfall results in inflation.

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[2] Paul Mcculley, "The Shadow Banking System and Hyman Minsky's Economic Journey", PIMCO, 2009.

Pakistan experienced a period of economic boom from FY2003 to FY2007 in which excessive money was created and inflation was observed, subsequently it is facing a period of bust or slow-down from FY2008 to FY2011, where the money supply is not increasing with the same rate but still the inflation is prevailing. The money supply average growth rate (calculated on year on year growth basis) from FY2003 to FY 2007 was 17.59 percent whereas from FY2008 to FY2011 it was 13.92 percent. The average inflation (calculated on year on year basis from CPI series) from FY2003 to FY 2007 it remained at 7.39 percent and from FY2008 to FY2011 it remained on average at 14.71 percent. This phenomenon motivates us to see the case of inflation in Pakistan with the lens of Paradox of Monetary Profits. That is, when the money supply is less than the total repayment amount – principal plus interest – does it put pressure on businessman? Who in turn tends to increase his output/product price, causing second fold inflation?

Thesis is divided into five chapters. Chapter II contains the literature survey and subsequently builds upon a theoretical framework for the paradox of monetary profits and the increase in prices by the firms. Chapter III outlines the methodology and discusses the data collection sources, variables, equations and statistical econometric techniques to be used. Chapter IV presents the graphical analysis and discusses the empirical outcomes. Chapter V is the conclusion and directs the further research directions in this regard.

CHAPTER II: LITERATURE SURVEY AND THEORITICAL FRAMEWORK

The paradox of monetary profits is argued majorly by non-orthodox or heterodox school. The argument is put forth by developing a monetary circuit, so-called 'Theory of Monetary Circuit'. Among main arguments, emphasis is also on the fiat or credit nature of money; which can be further classified as exogenous (government created) money and endogenous (bank created) credit money Graziani (2003). "When we think about the money supply in the economy we usually are thinking about the aggregate of the fiat money and the credit instruments that are more or less accepted as means of payment."[3] "Since most money is created through multiple credit creation, money and debt are, therefore, balance sheet counterparts. This debt would show up in the aggregate economy in the form of private sector and public sector debt"[4]. For a mere presence of money someone will have to borrow from the bank, briefly, money enters in an economy as a debt, Greco (1990).

"Circuitists see money first and foremost as debt, within the context of a generalized monetary theory of production. They emphasize the nature of money (as debt), and only after look at the roles and functions of money. In this sense, what money is (debt issued by banks) is the same as where money comes from (bank loans). The inevitable conclusion is that money is always and everywhere an endogenous phenomenon. This is not to say, of course, that money has no functions, for clearly it has. Money is of course a unit of account, and it is indeed a medium of exchange and a store of value. But this analysis should be secondary in a

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[3] Martin Shubik, "The Theory of Money", Cowles Foundation for Research in Economics at Yale University, 2000.

[4] Ahamed Kameel Mydin Meera, "Part I: Seigniorage Of Fiat Money And The Maqasid Al-Shari'ah: The Unattainableness Of The Maqasid", Humanomics, 2006.
In Pakistani economy only 0.12 percent of the currency is government issued (coins) and the rest 99.86 percent is bank issued (SBP and Commercial Banks). Coins compared with M2, as of April 2011.

theory of endogenous money. Only once money is created can we look at its functions and roles. Thus circuitists are interested in the nature of money ab-ovo, and the functions of money ex post...Capitalist economies are debt economies: production cannot be separated from the discussion over credit, banks and debt. The starting point is Keynes's reference in the Treatise that money 'comes into existence along with debts' (Keynes, 1930/1971, p.3; Davidson, 1972/1978, p. 147)."[5]

For explaining paradox of monetary profits, Smithin (2009) takes up the example of Marx's monetary circuit (1976); i.e. M – C – C′ – M′

Where; M = Initial Money Supply

C = Initial Quantity of Commodities

C′ = More Commodities than Initial Commodities

M′ = More Money than Initial Money

"Perhaps the single most important question to ask in attempting to understand the method of enterprise is, how it is *possible* for M' to be greater than M ($M' > M$) in the aggregate and on average across all enterprises, and thereby for profits to exist."[6] Smithin (2009) takes a hypothetical world in which a bank is already present; an entrepreneur takes out loan M of $100,000 for starting his business. Spends it in economy for raw material and wages i.e. C and transforms it into C′. If any profit is to be gained the final commodities must be monetary sale out for M′; more than initial investment, but the amount which can be gained at maximum is equivalent to M, because M quantity of money is created by the bank.

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[5] Louis -Philippe Rochon, "On Money and Endogenous Money: Post Keynesian and Circulation Approaches", Modern Theories of Money: The Nature and Role of Money in Capitalist Economies, 2003.

[6] John Smithin, "Weber's "Last Theory of Capitalism" and Heterodox Approaches to Money and Finance", York University, 2009, Draft, Pg 13.

Thus some other borrower should be willing to take a loan from bank and increase the money supply i.e. M. Here the occurrence of profit has a postulate that one entrepreneur sells more than the other. Hence, one entrepreneur will succeed and the other will lose. If the other one wants to be successful then there must be third entrepreneur willing to borrow the money and take a chance. "This is why Keynes (1964) said that there would be trouble if the "animal spirits" of entrepreneurs faltered."[7]

The other possibility for occurrence of a profit is that the consumers are willing to take a loan from bank and go into debt, but the question arises that how to make this consumer boom sustainable if they start feeling the debt pressure – paying their debt, Smithin (2009). The other possibility is that the government is willing to go in debt and run budget deficit and create demand in this way but the problem arises when the politicians raise voice against budget deficit and those wealthy persons who have enough money start seeing their money value depreciating in form of inflation – more money chasing fewer goods, Smithin (2009). "This last statement brings up the general point that for profits to be "real" (not inflationary), $M' > M$ must stimulate production, that is $C' > C$ in "value" or "real" terms, to the same extent. If the quantity of commodities, C, stays constant, then $M' > M$ will only mean a rise in money prices."[8]

Smithin (2009) differentiates between the concept of increase in money supply and the orthodox concept of velocity of money in circulation. As the former one is here under

[7] John Smithin, "Weber's "Last Theory of Capitalism" and Heterodox Approaches to Money and Finance", York University, 2009.

[8] John Smithin, "Weber's "Last Theory of Capitalism" and Heterodox Approaches to Money and Finance", York University, 2009.
"This is what those who complain about "excessive" credit creation, or who propose to strictly limit the quantity of money, are thinking about. This line of thinking, however, is misguided. Such restrictions will only lead to more economic problems because, as we have shown, there would be no incentive for production to place at all unless there *are* indeed some money profits to be made. Rather the goal of policy should obviously be to allow "enough" credit creation to make $M' > M$ roughly correspond to $C' > C$, though this is far easier said than done."

consideration but not the latter one, because the $20 bill may pass through many hands and can appear to generate or support $100, $200 or $300 of business. "However, nobody can end up with more than $20 in their pocket, or to show to their accountant. This is the essential point."[9]

This shortfall of money supply is also in line with the analysis of Graziani (2003) "It is self evident that since the only money existing in the market is the money that banks have lent to the firms, even in the most favorable case, the firms can only repay in money the principal of their debt and are anyhow unable to pay interest."[10] Graziani further postulates that there is a solution that is, the banks settle the debt in kind vis-a-vis output of the firm or sell its equity in lieu. The other solution is a government sector taking debt on itself, where a governmental deficit might help the firms to repay their outstanding interest to the banks "but a government debt towards the central bank would remain pending."[11] These problems arises in closed economy, if there is open economy then any flight of domestic saving rises more problems for the domestic firms, Graziani (2003).

To keep money supply in ample quantity so that equality is maintained between repayment amount and money supply, "more money must be created and more loans made."[12] If any positive gap is found between repayment amount and money supply – credit plus interest is greater than money supply[13] – due to, say, contraction in willing borrowers, this shortfall will lead towards slowdown in an economy, Greco (1990). "When a tight money policy is being advanced by the FED [central bank] it causes many debtors to default on their

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[9] John Smithin, "Weber's "Last Theory of Capitalism" and Heterodox Approaches to Money and Finance", York University, 2009.
[10] Augusto Graziani, "The Monetary Theory of Production", Cambridge University Press, 2003.
[11] Augusto Graziani, "The Monetary Theory of Production", Cambridge University Press, 2003.
[12] Thomas Greco, "Money and Debt: A Solution to the Global Crisis", 1990.
[13] C+I > M

loans. The subsequent consequences are foreclosure by the banks and seizure of any property which has been pledged as collateral."[14] Simply there will be less money in an economy then required to carry on. Hyman Minsky (1992) established theories of financial markets fragility and its injection in normal business cycle of an economy, known as 'financial instability hypothesis'. According to Magnus, the Minsky Moment starts by "a prolonged period of rapid acceleration of debt" in which more traditional and benign borrowing is steadily replaced by borrowing that depends on new debt to repay existing loans. Then the "moment" occurs, "when lenders become increasingly cautious or restrictive, and when it isn't only overleveraged structures that encounter financing difficulties. At this juncture, the risks of systemic economic contraction and asset depreciation become all too vivid."[15] Financial crisis of 2008 brought his theory back in highlights, Mcculley (2009).

During the boom period of business cycle, banks and firms both feel positive in loaning up. Firms see sales and profits expanding and are not much concerned about their ability in repaying loans, Greco (1990), "at some point, as human and capital resources approach full utilization and more money is siphoned off as profit and interest, costs begin to rise. At the same time, the available collateral becomes "loaned up" and increasing amounts of interest and principal come due. With increasing rates of inflation, the banks raise interest rates and begin to tighten up on credit. Business begins to fall off. As money begins to become increasingly scarce, there is a tendency to hold onto it. Debtors must turn it over to the banks as fast as they get it to stave off bankruptcy and foreclosure. A dollar paid against a debt disappears from circulation. The money supply tends to shrink because debts are being repaid faster than new debts are being incurred."[16]

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[14] Thomas Greco, "Money and Debt: A Solution to the Global Crisis", 1990. [addition]
[15] Magnus, G. "The Credit Cycle and Liquidity: Have We Arrived at a Minsky Moment?" Economic Insights—By George, UBS Investment Research, London.March, 2007.
[16] Thomas Greco, "Money and Debt: A Solution to the Global Crisis", 1990.

Meera (2006) have taken up a mathematical derivation to show the uprising of default scenario. "

$$X = \sum_{i=1}^{n} \alpha_i = \sum_{i \epsilon I_1(t)} \alpha_i + \sum_{i \epsilon I_2(t)} \alpha_i \quad and \quad I = I_1 \cup I_2 \quad \dots (1)$$

$$D = \sum_{i \epsilon I} \beta_i \quad \dots (2)$$

$$G = X + D \quad \dots (3)$$

$$R \leq X < X + D = G \quad \dots (4)$$

Thus

$$R < G \quad \dots (5)$$

Where;

X = the initial amount of money lent to the players.

I = {1, 2, . . . n} is the set of players.

αi = the initial debt of player *i*, *i*=1, 2, . . . , n.

W*i* =the real asset of player i or his wealth or the maximum level of debt that he can bear.

α = the rate of interest, $\alpha \square]0, 1[$.

βi= the amount by which the debt increases at the end of the period (for example 1 year).

I_1 = the set of players who reimburse at the end of period.

I_2 = the set of players who didn't reimburse at the end of period.

D = total debt of all players (or aggregate debt) generated by interest.

G = the global (or aggregate) debt of all players.

R = the global amount of money reimbursed at the end of period by all players." [17]

[17] Ahamed Kameel Mydin Meera, "Part I: Seigniorage Of Fiat Money And The Maqasid Al-Shari'ah: The Unattainableness Of The Maqasid", Humanomics, 2006.

The explanation of the above equations is that the banks most of the time lends equal to or less then the borrower's wealth, i.e. $\alpha_i \leq W_i$; so that if the borrower defaults then the bank can get the money back which it lent. Suppose that the borrower i fails to repay the loan and defaults for periods $n = \log (W_i / \alpha_i) / \log (1+ \alpha)$ "(if this number is not integer, take the integer part plus 1)"[18] the total debt amount will become around the wealth of the borrower, which gives bank a chance to seize all the wealth of the borrower if it wants. As the interest rate α is always positive therefore the total debt D is also positive. Whereas the fact is that only X amount of money is present for the players and the total amount D brought up due to interest doesn't exist in economy. Thus from equation 5 it can be deduced that in aggregate the total repaid amount of money is always less than the required amount of money, i.e. some player will default surely in aggregate. Even if the loans are repaid on installment basis and the bankers spend back the money then also the default scenario arises, nevertheless this tactic 'camouflaged' the default scenario[19], this default scenario continues for any given period.

Shubik (1999) while presenting a model argues on the default scenario as, "even though the model suggested here covers only one period of time, it becomes meaningful to consider an endogenous rate of interest as defined by

$$1 + \rho = \frac{u}{M}, \qquad \text{where} \quad u = \sum_{j=1}^{n} u^i$$

[Where ρ is the interest rate, M is the total fiat money supply and u is the total repayment amount (loan plus interest).] If $\rho > 0$, this implies that someone will go bankrupt. The variable ρ is understood to represent a loss reserve charged by the bank such that even if

[18] Ahamed Kameel Mydin Meera, "Part I: Seigniorage Of Fiat Money And The Maqasid Al-Shari'ah: The Unattainableness Of The Maqasid", Humanomics, 2006.
[19] For more detail on this see transcript of Money as Debt – II (Promises Unleashed) by Paul Grignon, 2009.

various traders go bankrupt the bank nevertheless obtains a return of capital...As soon as an economic value to the introduction of credit appears, not only must default conditions be introduced but the economic purpose and distinctions between different types of borrowers and lenders must be specified. "[20]

To safeguard a business from falling off the edge, different strategies are taken up by the firms. Putting it in a way of financially constrained business, Chevalier (1996) concludes that "during recessions, liquidity constrained firms boost short-run profits by raising prices to cut their investments in market share"[21] Bruce Greenwald et al. (1984), Klemperer (1995) and Nils Gottfries (1991) have suggested that due to capital market imperfections markups may be countercyclical. During a recession or downturn when firms have difficulty raising external funds and they are facing low cash flow, to boost their current profits to match with their liabilities and finance investment, they may increase their prices and forgo attempts in building their market share, Chevalier (1996).

Docters (2004) argues while suggesting price tactics in boom and bust periods that "some sellers hike their prices in a downturn. They reason that as volume starts to slacken, unit price increases will make up the difference. Indeed, if switching costs are high and the switching cycle long, this logic has a certain short-run validity."[22] Docters (2004) gives an example of a survey conducted in 2001, among 35 companies which involved dozen industry categories, in which in spite of a hiring freeze instituted by the five companies they were still raising their prices.

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[20] Martin Shubik, "The Theory of Money and Financial Institutions: Volume 1", MIT Press, 1999.
[21] Judith A. Chevalier, "Capital-Market Imperfections and Countercyclical Markups: Theory and Evidence", The American Economic Review, 1996.
[22] Rob Docters, "Pricing For Boom or Bust: Smart Moves for Maximum Flexibility", Journal of Business Strategy, 2004.

Deleersnyder (2004) in her study about effect of business cycle on prices of durable goods quotes, "that, especially during high-demand periods (booms), it is more beneficial to undercut on the high collusive price, implying that collusion will be less likely to be sustained, Rotemberg and Saloner (1986). This leads to lower competitive prices during expansions and higher collusive prices during contractions. Moreover, Marn, Roegner, and Zawada (2003) argue that increasing prices (p) during a contraction allows companies to offset revenue losses ($p.q$) caused by reduced sales (q) levels. Chevalier and Scharfstein (1996) stress that credit market imperfection may prevent companies from choosing the prices that, according to normative theory, would maximise profits. They show that during contractions, financially-constrained firms raise prices relatively more than less-financially constrained firms. Empirical analyses on the issue predominantly support the existence of higher prices during contractions (conform Rotemberg and Saloner's view) (see e.g. Backus and Kehoe, 1992; Rotemberg and Saloner, 1986; Rotemberg and Woodford, 1999)."[23] She concludes as "companies' pricing practices were found to amplify the cyclical sensitivity in durable sales, as companies tend to increase prices during an economic contraction, while decreasing them during an expansion."[24]

The literature survey maintained a systematic increment in the argument, starting from the paradox of monetary profits highlighting heterodox school and joining the paradox with a slowdown in economic activity via contraction of money supply in comparison to outstanding amount which brings pressure on the business sector tending them for increase in prices causing yet more inflation.

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[23] Barbara Deleersnyder, "Weathering Tight Economic Times: The Sales Evolution of Consumer Durables Over the Business Cycle", Quantitative Marketing and Economics, 2004.

[24] Barbara Deleersnyder, "Weathering Tight Economic Times: The Sales Evolution of Consumer Durables Over the Business Cycle", Quantitative Marketing and Economics, 2004.

CHAPTER III: METHODOLOGY

A. Problem Statement

Beside the other determinants of inflation, inflation also occurs when there is a shortfall in money supply in comparison to the total repayment amount i.e. a positive gap between credit plus interest and total money supply available in economy. *More debt chasing less money* generates indirect inflation.

B. Hypothesis

H_0 = the inflation in positive and negative IhG[25] period is same

H_A = the inflation for the period when IhG is positive is significantly higher

C. Methodology

Empirical evidence is presented by employing sophisticated econometric techniques. First of all, we showed that inflation for the period when IhG is positive is significantly higher than the negative period of IhG by using 'Students t-test'. Secondly, we showed that the slope of CPI series increases significantly for the period when IhG is positive by using 'Structural Break'. Thirdly, we showed that long run relationship exists between IhG and CPI by using 'Johansen Cointegration'. Fourthly, we showed that Inherent Gap Theory of inflation is not encompassed by Quantity Theory of Money and on the other hand there is a need of cautious statement that Inherent Gap Theory encompasses Quantity Theory of Money

[25] Shortfall in money supply is here mentioned as Inherent Gap (IhG).

as there are some weak evidences in this regard. Lastly, we also formulated a general model which encompasses these two non-nested models.

D. Data

Money supply and consumer price index or inflation data is collected for testing the hypothesis. Data is collected from State Bank of Pakistan and Federal Bureau of Statistics. Data variables are discussed below:

- For the time span starting from July 2003 to April 2011.
- Making around 94 observations, collected on monthly basis.
- The source of data is from various published annual reports, statistical bulletins and corresponding archive variables of State Bank of Pakistan.
- The variables comprises of:[26]

Table 1: Data Variables	
M2 = Broad Money	DR = SBP Discount Rate
CGS = Credit to Government Sector	TBR = Treasury Bill Auction Rate
CNGS = Credit to Non Government Sector	IhG = Inherent Gap
TC = Total Credit (Domestic Credit)	CPI = Consumer Price Index (CPI)
TCI = Total Credit plus Interest	

[26] Data from various SBP Annual Reports and Statistical Bulletins: M0, M2, CGS, CNGS, TC
Data from SBP Archive Files: DR, TBR
Data from FBS: CPI

E. Equations

The above variables are used in the following equations to determine the Inherent Gap series. There is no direct way of obtaining the IhG series, so it is to be constructed using existing variables. The equations are:

$$TC = CGS + CNGS \qquad \ldots\ldots\ldots (1)$$

$$TCI = CGS \times \frac{TBR}{100} + CNGS \times \frac{DR}{100} + TC \qquad \ldots\ldots\ldots (2)$$

$$IhG = TCI - M2 \qquad \ldots\ldots\ldots (3)$$

The first equation determines the total credit in the economy, which has been borrowed by the government and the firms. The credit has been given by the central bank and the commercial bank. The second equation determines the total credit plus interest, which is the amount that has to be repaid by the borrowers in totality – including interest. The third equation determines the inherent gap, which is a subtraction of total credit plus interest from broad money.

F. Econometric Techniques

Following statistical and econometric techniques are used. All the techniques used are well discussed in the literature; we will here mention the encompassing technique only.

F1. Tests to be Used

- Students t-test
- Testing Structural Break
- Johansen Cointegration
- Encompassing

F2. Encompassing

For the purpose of model comparisons, encompassing provides the basis. The objective of encompassing evaluation is to test that whether or not the present theory can build the relation between the results found by other, Ahumada (2010). Suppose we want to test whether Model 1 encompasses Model 2. If Model 1 fails to encompass Model 2 then it shows that Model 2 contains some specific characteristics that Model 1 doesn't contain, Bontemps (2008)

More technically, "to exposit the idea, denote the data generating process $h(y;\square)$ of a set of data y on the independent, identically distributed stochastic process y_t by M_0, the null model $f(y;\delta)$ by M_1, and the rival model $g(y;\mu)$ by M_2, with $\square$, δ and μ vectors of dimension n, m and p, respectively. As the null and rival models are (usually reduced) reparameterizations of the data generating process, their parameter vectors δ and μ must be obtained from $\square$ through suitable mappings $R^n \rightarrow R^m : \delta = \square_{10}(\square)$ and $R^n \rightarrow R^p : \mu = \square_{20}(\square)$. If some components of δ or μ are not identifiable through $\square$, then the corresponding model could not be a reparameterization of the data generating process.

Then, the null encompasses the rival model if there exists a mapping $R^m \rightarrow R^p : \mu = \square_{21}(\delta)$, that is if the parameterization μ of the rival model can be predicted from the parameterization δ of the null model. This condition implies that:

$$\Phi_{20}(\square) = \Phi_{21}(\Phi_{10}(\square)).$$

Similarly, M_2 encompasses M_1 if there exists a mapping $R^p \rightarrow R^m : \delta = \Phi_{21}(\mu)$, which implies that:

$$\Phi_{10}(\square) = \Phi_{12}(\Phi_{20}(\square)).$$"[27]

Quantity Theory of Money is a very prominent theory used in estimating inflation and policy recommendation. In Pakistan also it is used by higher authorities for targeting inflation and keeping it in check, it is concluded by researches all across the board, some of the studies are; Bilquees (1988); Hossain (1990); Nasim (1995); Khan and Qasim (1996); Ali (1996); Ahmad, *et al.* (2005); Hussain (2006); Khan and Schimmelpfennig (2006); Husain and Rashid (2006); Kemal (2006); Qayyum (2006). In order to apply encompassing we make use of basic model of Quantity Theory of Money (QTM) and compare it with Inherent Gap Theory (IhGT). Both the theories are discussed in detail shortly.

The hypothesis for encompassing is:

H_0 = Model 1 (QTM) encompasses Model 2 (IhGT)

H_A = Model 2 (IhGT) encompasses Model 1 (QTM)

[27] Hendry et al. , "Introduction to Special Issue on Encompassing", Oxford Bulletin of Economics and Statistics, 2008.

Oxmetrics – PcGive software is used for this testing. Usually Oxmetrics PcGive uses Cox, Ericsson IV, Sargan, Joint Model tests and shows the results of both the models encompassing each other.

a) Model 1: Quantity Theory of Money (QTM)

The transaction approach of quantity theory of money or the basic quantity theory of money highlights the relationship between money supply, velocity of money, prices and real income; (*M*) (*V*) (*P*) (*Y*) respectively as,

$$MV = PY$$

The econometric equivalent of this identity is; Qayyum (2006),

$$gP = \beta_0 + \beta_1 gM + \beta_2 gV + \beta_3 gY + \mu$$

Here gP, gM, gV, gY and μ represent a year on year percentage growth of prices, broad money supply, velocity, gross domestic product and disturbance term. Data is taken for the same time period i.e. from 2003 July to April 2011, with a monthly frequency. CPI is used for prices (P); M2 broad money is used for money supply (M); Velocity (V) is assumed constant and Industrial Manufacturing Index as a monthly proxy for GDP (QIM); Bokil and Schimmelpfennig (2005).

Broad money supply or M2 has been used in number of studies related to inflation or/and monetary, Khan and Gill (2010), Rashid and Hussain (2010), Kemal (2006), In Pakistan "the main indicator of money supply is M2, which is the broader definition of money supply. The main heads of causative factors of changes in the monetary assets (M2) in Pakistan are credit to government sector, credit to nongovernment sector and Other Items Net

(OIN). Credit to government sector is further subdivided into: (a) Net budgetary borrowing; (b) borrowing for commodity operations; and (c) net effect of Zakat fund/Privatization proceeds etc. In addition to this, credit to non-government sector is subdivided into: (a) credit to private sector; (b) credit to Public Sector Enterprises (PSEs); and (c) SBP credit to Non Bank Financial Institutions (NBFI)."[28]

Unrestricted ARDL estimation technique is used with lag structure of 12, as some researchers have identified role of lags in Pakistan, Naqvi and Khan (1989), Ahmad, *et al.* (2005), Husain and Rashid (2006), Kemal (2006), Qayyum (2006). By using autometrics we will derive the specific model. The estimation general model is:

$$g(P)_t = \beta_0 + \sum_{i=1}^{12} \beta_i g(P)_{t-i} + \sum_{i=1}^{12} \alpha_i g(M)_{t-i} + \sum_{i=1}^{12} \gamma_i g(QIM)_{t-i} + \mu_t \qquad \ldots\ldots (4)$$

All the variables have been transformed into a year on year (yoy) percentage growth basis. Where gP, gM and gQIM are the percentage growth in prices (CPI), percentage growth in broad money supply and percentage growth in industrial manufacturing sector respectively. μ_t is the disturbance term in the model.

b) Model 2: Inherent Gap Theory (IhGT)

The Inherent Gap Theory highlights the relationship between shortfalls in money supply as compared with total repayment (credit plus interest) and prices i.e. the role played by the variables TCI, IhG and P.

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[28] Agha and Khan, "An Empirical Analysis of Fiscal Imbalances and Inflation in Pakistan", SBP Research Bulletin Volume 2, Number 2, 2006

Variables, data and time period has been discussed above in section 'D' and 'E'. As for the IhG series, in this model we use the dummy variable generated on the basis of positive and negative regime of IhG i.e. when the IhG series is negative then a '0' is applied against it and when the IhG series if positive then a '1' is applied against it. Unrestricted ARDL estimation technique is used with lag structure of 12. By using autometrics we will derive the specific model of inflation for Pakistan. The estimation general model is:

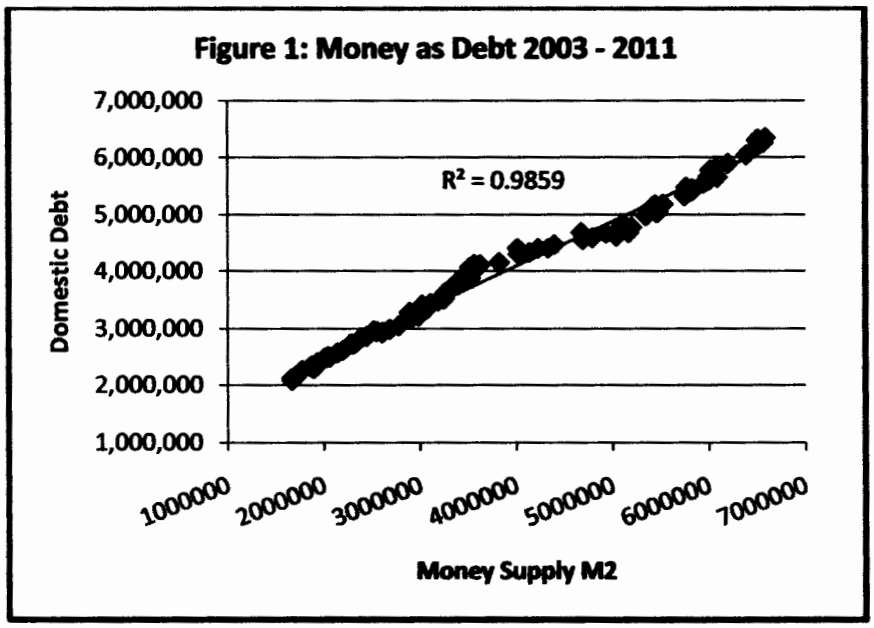
$$g(P)_t = \beta_0 + \sum_{i=1}^{12} \beta_i g(P)_{t-i} + \sum_{i=1}^{12} \alpha_i g(TCI)_{t-i} + \gamma_i dIhG + \mu_t \qquad \ldots\ldots (5)$$

Where, gP and gTCI are the year on year basis percentage growth of prices (CPI) and total credit plus interest. dIhG is the dummy variable of inherent gap and μ_t is the disturbance term in the model.

CHAPTER IV GRAPHICAL AND EMPIRICAL ANALYSIS

A. Graphical Analysis

All – neglecting 0.49 percent of government minted coins[29] – the money which enters the system is a debt. The relation between domestic debt\credit and domestic money supply is highly correlated, $R^2 = 0.98$. As the money supply increases so as the debt, figure 1, below shows the relation between money supply and borrowing.



The starting point is 'money stock available in economy (money supply M2)[30]', which is Rs. 6,346,047 million as on April 2011. 'Domestic borrowing/credit'[31] includes both, government and non government sectors, which is Rs.6,584,335 million as on April

[29] SBP Annual Report 2009-2010, June 2010 figures:

- The value of One Rupee Coins and Above + Subsidiary Coins is Rs.8,271million. The total of printed Five Rupees Bill and above (paper notes) is Rs.1,377,277million. The reserve money or M0 is Rs.1,679,286million, thus coins are only 0.49 percent of M0. The total amount of currency minted and printed is Rs.1,385,548, and coins comprises only 0.59 percent of total currency available in the economy.
- In Pakistani economy: only 0.14 percent of the currency is government issued (coins) and the rest 99.86 percent is bank issued (SBP and Commercial Banks). Coins compared with M2, as of June 2010.
- Reserve Money M0 = 1,679,286 and Broad Money M2 = 5,777,231; M0/M2 * 100 = 29.06

[30] M2 data collected from various SBP Monthly Statistical Bulletin and Annual Reports.

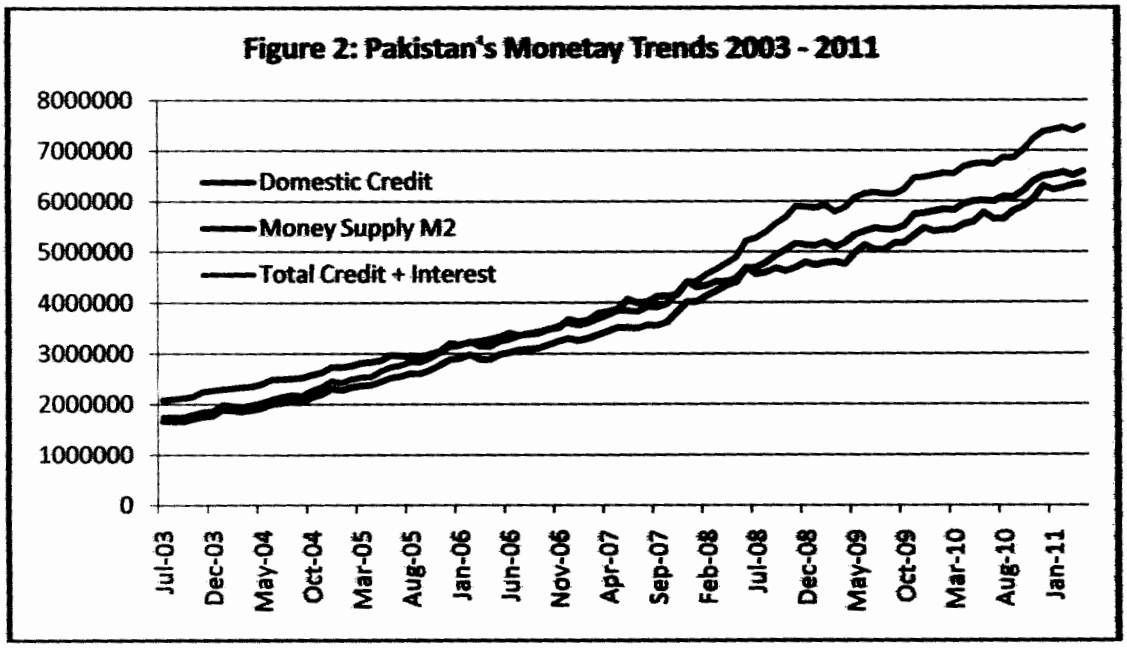
[31] Consulted various SBP Monthly Statistical Bulletin and Annual Reports.

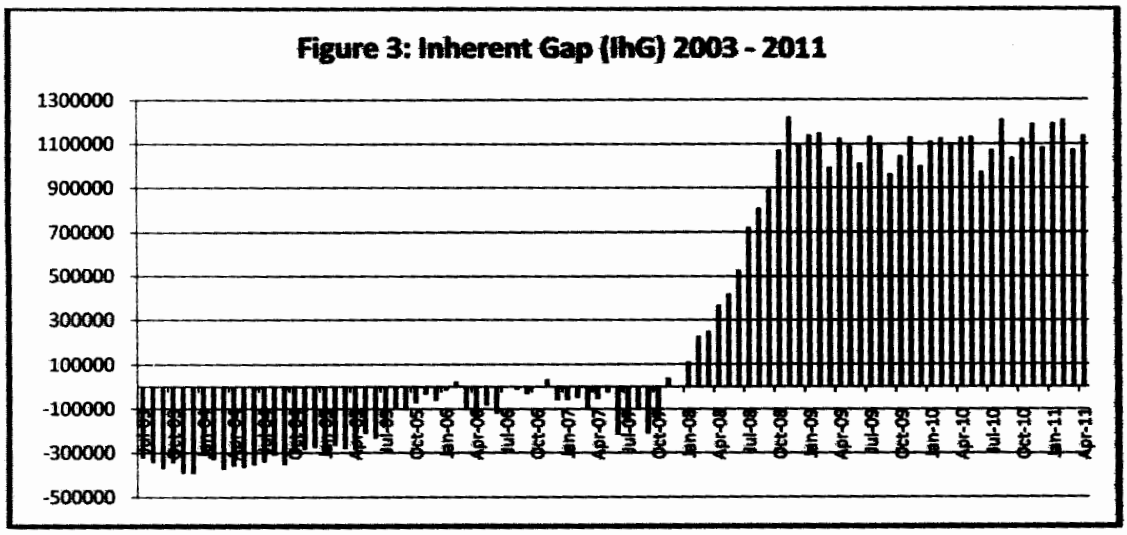
2011. Finally the amount to be repaid back, 'credit *plus* interest'; the interest rate is 3 months T-Bills[32] auction rates for governmental sector and discount rate as set by State Bank of Pakistan for the non-governmental sector, which is 13.25 percent and 14.00 percent respectively, for April 2011. This makes the total repayment amount to Rs.7,485,265 million as on April 2011.

To see the minimum impact of government borrowing the 3 months rate is taken as they are the least from all and also the discount rate for non-governmental sector so as to see the minimum impact of this sector. Keeping in mind this is the minimum gap between M2 and the amount to be repaid, the gap is of around Rs. 1,139,218 million or Rs.1.13 trillion.

Table 2: Monetary Description as on April 2011	
Money Supply M2	Rs.6,346,047 million
Domestic Borrowing/Credit	Rs.6,584,335 million
Credit + Interest	Rs.7,485,265 million

[32] T-bill auction rates as published by SBP



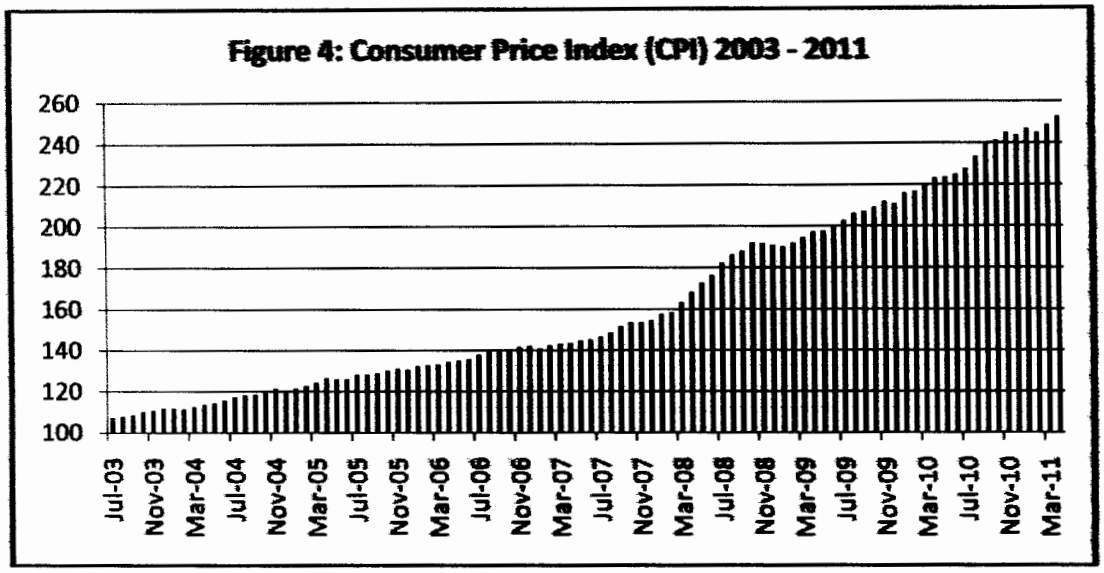


In the above figure it is highlighted that over the time, gap between domestic money M2 and the amount liable for repayment i.e. interest plus credit is rising. The inherent gap turned positive significantly after January 2008, before 2008 the gap was negative or slightly positive; currently, as on April 201 the gap is of around Rs.1.13 trillion. This clearly shows that there is not enough money in economy to make the repayments. Even if full strength is applied by all the sectors they couldn't repay the amount due on them. Eventually, someone will fail in making the payments back, Lietare (1997).

Prior to January 2008, economy was in boom; banks were giving more credits, simultaneously more money was created. The borrowing share of non-government sector or private sector on January 2007 was around 75 percent of the total credit – the maximum. Which now have tremendously declined at around 58 percent on April 2011. Likewise the borrowing share of government sector was at around 25 percent on January 2007 and now it have increased to 42 percent, April 2011 (see figure 7 in appendix). Overall, there is a slow growth of credit in the economy since January 2008 and more slow growth from 2009 onwards. During the same period, growth in M2 was also high it also declined after January 2008. One more reason for the effect on M2 is, "money is created when a bank authorizes a loan and is extinguished when the loan is repaid."[33] For the mere existence of money, it is necessary that it is loaned out again. So, nearly during this period – Nov 2008 onwards – less loans were taken out and more loans were repaid (see figure 8 in appendix).

One more reason for this gap is the interest rate increments. As it can be seen in figure 9 (in appendix), that the interest rate was very low in the initial periods of data; t-bill auction rate was 1.65 percent and discount rate was 7.5 percent, then by the end of 2007 there is hike in t-bills auction rate to around 9 percent with discount rate at 10 percent. From Jan 2008 onwards the interest rate of t-bills and discount rate increased tremendously, with a maximum at around 13 percent and 15 percent, currently at 13.24 and 14 – April 2011. This role of interest rate played majorly in turning the inherent gap positive.

[33] Thomas Greco, "Money and Debt: A Solution to the Global Crisis", 1990.



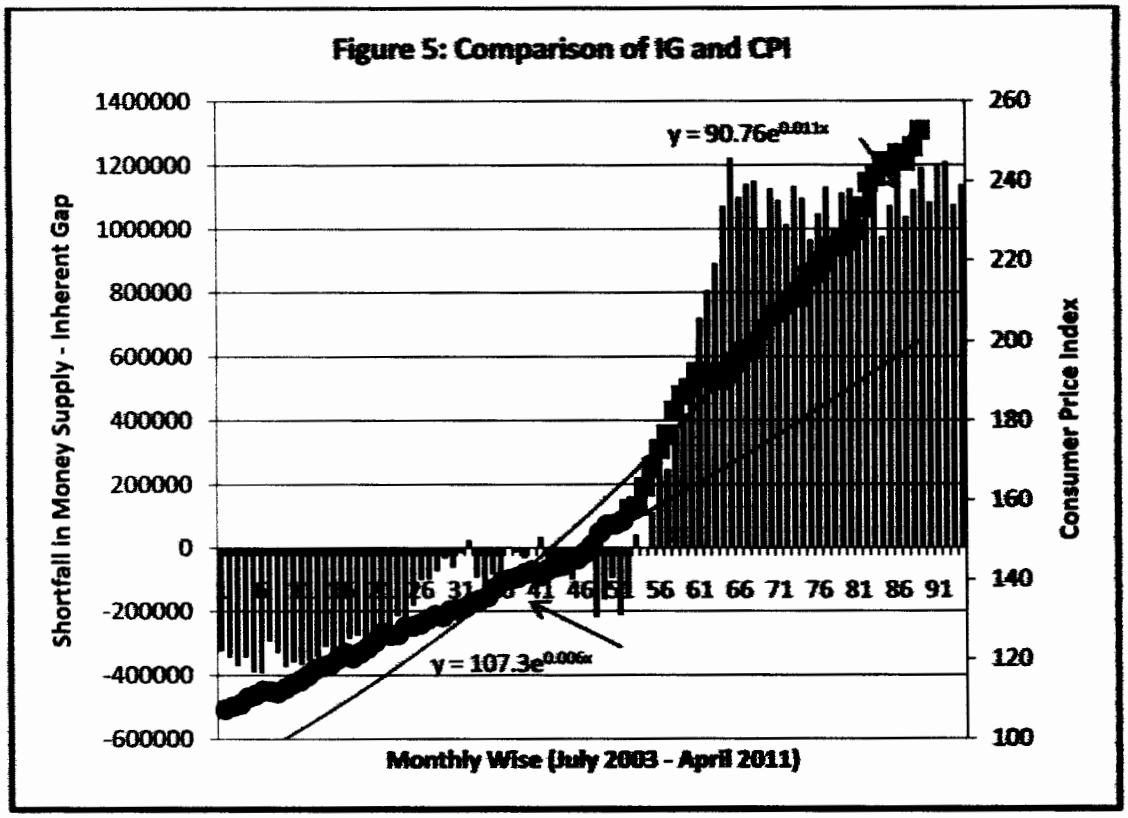
Turning towards Consumer Price Index, since July 2003 to April 2011 CPI have gained around 152 percent. Keeping the base year of 2001 the CPI have now reached to 252 percent – April 2011 – Which simply means that the prices have more than doubled in present time as compared to year 2001. The significant point is that, during Dec 07 the CPI was 154, means only 54 percent increase in the prices since year 2001 i.e. 7 years, but from Jan 2008 to now CPI faced an increment of 98 percent. So, within a time span of some 4 years and 3 months it gained 98 percent as compared to an increment of 54 percent in 7 years.

Like most of time series, the price series is also trending. For the trending variables, the investigation of relationship needs sophisticated econometric tools. It can be misleading to use simple discriptive or OLS to analyze the relationship between IhG and CPI. However the inflation, which is the rate of change in CPI, and positive and neative regimes in IhG can be used safely with simple discriptives to analyze the mutual relation. In the graph of CPI, the slope coefficient represent the change in price, which is not trending. The figure 5 shows that the slope of CPI series suddenly increases when the IhG turns to be positive. Furter investigation can be carried out by keeping in view the effect on CPI while the inherent gap was negative and when the inherent gap is positive – period from July 03 to December 07 and

period from January 08 to April 2011 respectively. Figure 5 clearly anticipates the 'quantity theory of money' as first fold inflation and 'inherent gap theory' as second fold inflation.

When the IhG is negative the CPI holds an increasing trend this is due to the fact of more money chasing fewer goods – as the economy is in boom i.e. in first and second business cycle the prices keep on increasing.

When the inherent gap is negative the growth in CPI is slow, the exponential function returns the value of 0.66 percent increase per month – from July 03 to December 07. As compared to the positive inherent gap period – from January 08 to April 11 – the CPI increases with increasing rate, here the exponential function returns the value of 1.10 percent growth rate. This change in rate of growth supports the theory of Quantity Theory of Money (QTM) and Inherent Gap Theory (IhGT) i.e. in the first fold the inflation rate is low and in the second fold when the economy feels the pressure of short money supply there is a tendency to increase the prices, giving a double boost to inflation.



B. Empirical Analysis

B1. Comparing Changes in inflation for Negative and Positive Inherent Gap Regimes

We want to analyze the difference in inflation for the two periods.

1. The period for which IhG is negative.
2. The period for which IhG is positive.

To test whether this gap is significant, we use two criterions

Evidence 1:

To further investigate the impact of break on CPI, OLS-Regression is employed by including dummy variables. The regression equation is:

$$CPI = \alpha + \beta_1 t + \beta_2 d_t + \beta_3 d_t * t + \in_t \quad \ldots\ldots\ldots (6)$$

Where; d_t = 0 for before break period (where gap is negative) and d_t = 1 for after break period (where gap is positive).

The estimated OLS regression equation is

$$CPI = 106 + 0.8565t - 63.69 d_t + 1.363 d_t * t + \in_t$$

(0.712) (0.0225) (2.72) (0.0415) (2.57889)

The numbers in the parenthesis are the Standard Errors.

The variables d_t and d_t*t are highly significant according to the usual t-test criterion. The exclusion test for the above regression shows that the variables dt and dt*t are jointly significant and the sign of d_t*t is positive, which shows a significant impact of break on the CPI. **(F (2,90) = 705.12 [0.0000]**)**

The positive sign of the slope dummy indicates that the slope (inflation) of CPI series is significantly higher for the period after break i.e. after changing the sign of inherent gap.

Evidence 2:

The average *inflation*[34] for month on month basis and year on year basis respectively:

1. Negative IhG is 0.689 percent and 7.458 percent.

[34] Conversion of CPI series by taking first and twelfth difference respectively.

2. Positive IhG is 1.094 percent and 15.854 percent.

We use Student's t-Test to evaluate whether there is significant difference between inflation for the two periods. Our hypothesis is as follow:

H_0: $I^- = I^+$

H_A: $I^+ > I^-$

Where, I^- is the inflation for period with negative IhG.

I^+ is the inflation for period with positive IhG.

We computed the t-test by using formula:

$$t = \frac{\left(I^+ - I^-\right)}{\sqrt{\frac{s_{I^+}^2}{n_{I^+}} + \frac{s_{I^-}^2}{n_{I^-}}}}$$

TH-9/9e

The computed t-stat is compared with (one sided) 5% critical value. The one tail critical value of "t" is 1.64, whereas calculated value is **2.14** for month on month basis inflation and **10.46** year on year basis inflation. The results show that H0 is rejected, which implies inflation for positive IhG period is significantly higher than negative IhG period.

B2. Testing Long Run Relation between IhG and CPI (Inflation)

The above analysis may be criticized for being based on stationarity assumption. Regression of the type (6) is valid only if the time series is trend stationary; however the stationarity of economic time series has been challenged by several economists. If the dependent variable is difference-stationary, than its regression on the significant coefficinent of equation (6) may be just the spurious as observed by Granger and Newbold (1974) and Nelson & Kang (1984). Modern time series analysis emphasis on testing the stationarity of

series, and the cointegration for getting reliable estimates of relationship between two variables. Therefore we test the two series for stationarity and for cointegration. We check the IhG and CPI series (only CPI series was transformed into a year on year (yoy) percentage growth basis – inflation) for unit root and see the existence of cointegration for concluding a long run relationship between both the series.

Unit Root Testing:

IhG and CPI series (only CPI series was transformed into a year on year (yoy) percentage growth basis – inflation) is tested for unit root using Augmented Dickey Fuller Test. The Oxmetrics result output is given below.

Table 3: Unit Root Test Results for IhG and INF

	IhG		INF	
Lag	t-adf	AIC	t-adf	AIC
12	-0.760	22.420	-1.150	-8.838
11	-0.741	22.390	-1.875	-8.618
10	-0.989	22.420	-2.018	-8.645
9	-1.104	22.400	-1.996	-8.672
8	-0.862	22.440	-2.078	-8.701
7	-0.968	22.410	-2.306	-8.726
6	-1.131	22.400	-2.154	-8.740
5	-1.007	22.400	-2.316	-8.768
4	-1.092	22.370	-2.882	-8.773
3	-1.186	22.350	-2.535	-8.768

2	-0.632	22.910	-1.937	-8.706
1	-0.740	22.920	-1.492	-8.649
0	-0.805	22.910	-1.140	-8.574
5%=-2.90 1%=-3.53				

Based on the graph of two series, ADF test was applied with constant and trend. The unit root results support existing of unit root for all lags used in ADF.

Cointegration Testing:

As the series are unit root, for any long run relationship to exist the series must be cointegrated. Now we test both series for possible Cointegration using Johansen Cointegration by keeping 12 lags, as the data is of monthly frequency and appropriate lag was selected according to AIC.

Table 4: Cointegration Testing

H0: rank<=	Trace test [Prob]
0	27.092 [0.000] **
1	0.4567 [0.499]

The calculated value of trace test for Johansen Cointegration is **27.092** whose p-value is **0.000** showing that **both the series are cointegrated**. This means the two variables have long run relationship between them.

The two procedure show that whether the two series assumed stationary or unit root, the positive effect of inherent gap on inflation is evident.

B3. Encompassing Evaluation of Inflation Models

The monthly data has been transformed into a year on year (yoy) percentage growth basis. The figure of the data set is given below:

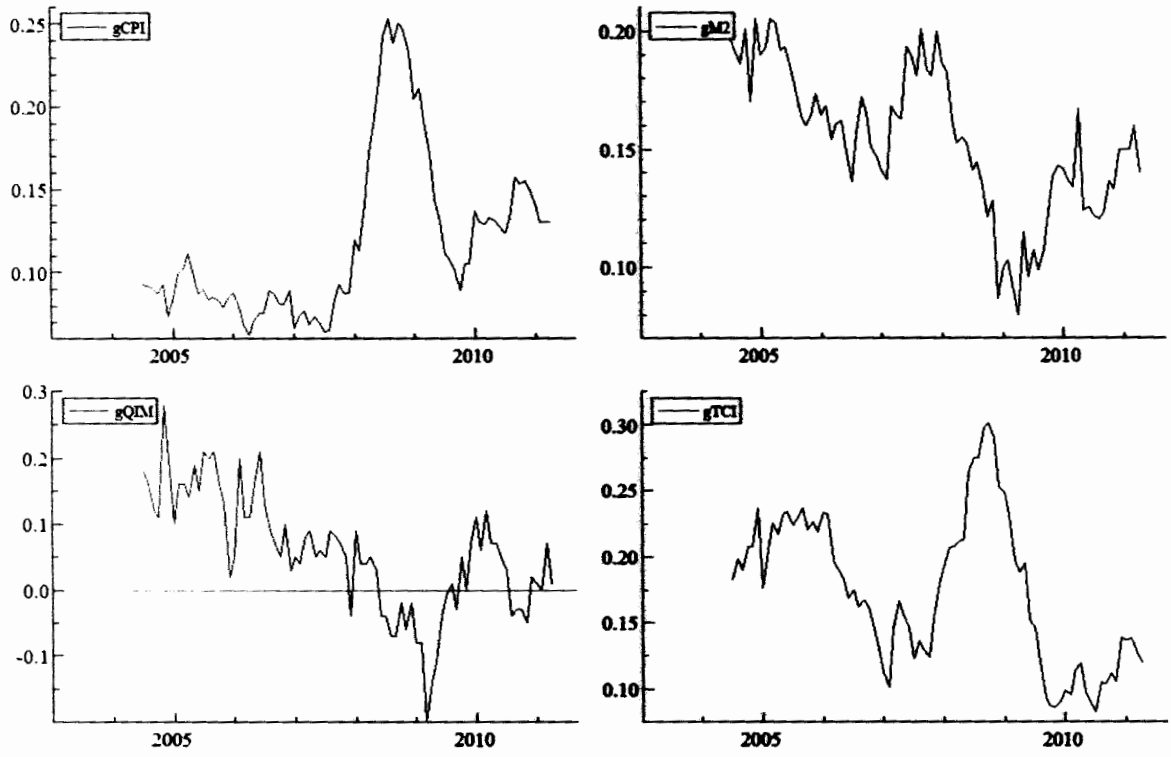


Figure 6: Data set YoY Growth of CPI, M2, QIM, TCI.

Before we go the model estimation and encompassing it is important to check the stationiarity properties of the series used in the two models. Recall Quantity Theory of Money and Inherent Gap Theory, these models include following variables gCPI, gM2, gQIM, gTCI. All these variables are the rate of change and there are strong theoretical reasons to believe that these series don't contain unit root. A property of unit root is that it has unbounded variance and can grow infinitely but the series under consideration are unlikely to grow unboundedly; for example, the inflation can't grow continuously on a high

rate for a long interval of time, this property of inflation is in clear contradiction with property of unit root. Therefore there is no need to test the stationarity of these series, the graph of these series also support this reasoning.

By using the autometrics option in Ox-Metrics (automatic model selection) on quantity theory of money the specific model results are:

Table 5: QTM Specific Model				
gCPI =	+ 1.086*gCPI_1	- 0.2122*gCPI_5	+ 0.1303*gM2_6	- 0.07088*gQIM_7
(SE)	(0.0385)	(0.0374)	(0.0276)	(0.0205)
Sigma = 0.0106718; DW = 2.30				
AR 1-5 test:	F(5,61)	=	1.0568	[0.3931]
ARCH 1-5 test:	F(5,56)	=	0.49736	[0.7769]
Normality test:	Chi^2(2)	=	4.4546	[0.1078]
Hetero test:	F(8,57)	=	0.30490	[0.9612]
Hetero-X test:	F(14,51)	=	0.46051	[0.9435]
RESET test:	F(1,65)	=	0.053482	[0.8178]

We applied number of tests on the above equation and it passed all the tests. All the variables have significant t value. The static long run equation for quantity theory of money is:

Table 6: QTM Static Long Run			
gCPI =	1.03411*gM2	- 0.56234*gQIM	
(SE)	(0.08611)	(0.1301)	

(t-value) (12.0)	(-4.32)
(t-prob) (0.0000)	(0.0001)
Long-run sigma = 0.0846679	
WALD test: Chi^2(2) = 161.561 [0.0000] **	

The coefficient signs of growth of money supply and growth in industrial manufacturing are in conformity of QTM. The results show that there is one to one relationship between inflation and growth in money supply, which is in line with literature and quantity theory of money. There is a moderate negative relationship between the industrial manufacturing or output growth and inflation, which is again in line with the literature. As there are studies which concludes this relationship to be very weak, between [-0.10 and -0.34], McCandless and Weber (1995), and some concludes this relationship to be negative, Kormendi and Meguire (1985), Ericsson, Irons, and Tryon (1993), and Barro (1995).

By using the autometrics option in Ox-Metrics (automatic model selection) on inherent gap theory the specific model results are:

Table 7: IhGT Specific Model

gCPI =	+ 0.9106*gCPI_1	- 0.2127*gCPI_5	+ 0.2761*gTCI_1	- 0.2797*gTCI_2
(SE)	(0.0564)	(0.0519)	(0.0767)	(0.0842)
	+ 0.194*gTCI_4	- 0.1511*gTCI_9	+ 0.09462*gTCI_12	+ 0.02482*dIhG
	(0.0595)	(0.0463)	(0.0338)	(0.00485)
Sigma = 0.0090507; DW = 2.31				
AR 1-5 test:	F(5,57)	=	0.60594	[0.6956]

ARCH 1-5 test:	F(5,52)	=	1.1479 [0.3473]
Normality test:	Chi^2(2)	=	0.48261 [0.7856]
Hetero test:	F(15,46)	=	0.96966 [0.5003]
Hetero-X test:	F(43,18)	=	1.0498 [0.4735]
RESET test:	F(1,61)	=	0.081375 [0.7764]

All the variables have significant t value. We applied number of tests on the above equation and it passed all the tests. The static long run equation for inherent gap theory is:

Table 8 : IhGT Static Long Run		
gCPI = 0.443076*gTCI + 0.0821599*dIhG		
(SE)	(0.02895)	(0.006810)
(t-value)	(15.3)	(12.1)
(t-prob)	(0.0000)	(0.0000)
Long-run sigma = 0.029965		
WALD test: Chi^2(2) = 1254.71 [0.0000] **		

The long run sigma value of IhGT (0.029) is significantly smaller then the long run sigma value of QTM (0.084). It means that IhGT is better explaining the inflation phenomena than QTM.

To further analyze the performance of IhGT in contrast with QTM the encompassing is applied, the encompassing results are:

Table 9: Encompassing (QTM vs IhGT)		
Encompassing test statistics: 2004(9) - 2011(4)		
M1 (QTM) is: gCPI on	gCPI_1 gCPI_5 gM2_6 gQIM_7	
M2 (IhGT) is: gCPI on	gCPI_1 gCPI_5 gTCI_1 gTCI_2 gTCI_4 gTCI_9 gTCI_12 dIhG	
Instruments used:	gCPI_1 gCPI_5 gTCI_1 gTCI_2 gTCI_4 gTCI_9 gTCI_12 dIhG gM2_6 gQIM_7	
Test	Model 1 (QTM) vs. Model 2 (IhGT)	Model 2 (IhGT) vs. Model 1 (QTM)
Cox N(0,1)	N(0,1) = -10.34 [0.0000]**	N(0,1) = -2.389 [0.0169]*
Ericsson IV N(0,1)	N(0,1) = 7.768 [0.0000]**	N(0,1) = 2.114 [0.0346]*
Sargan	Chi^2(6) = 24.386 [0.0004]**	Chi^2(2) = 4.1442 [0.1259]
Joint Model	F(6,60) = 5.8602 [0.0001]**	F(2,60) = 2.1489 [0.1255]

The encompassing result for the QTM vs IhGT shows that the QTM does not encompass the rival theory. The null hypothesis that QTM encompasses IhGT is rejected with high level of significance. Whereas the second encompassing result of IhGT vs QTM shows weak evidence of IhGT encompassing QTM, but we cannot safely defend our this argument as two tests (Sargan and Joint Model) are in favor and the other two are rejecting the hypothesis. Thus it can be safely argued that IhGT have its own domain and it helps in further explaining features of inflation that QTM cannot explain.

Since QTM and IhGT fail to encompass each other, this implies getting a nearly final model which would contain variables of both the two theories, thus providing a better explanation of inflation. Variables of both the theories were combined, by putting 12 lags and using autometrics for deriving a specific model.

The general model and results are:

$$g(P)_t = \beta_0 + \sum_{i=1}^{12} \beta_i g(P)_{t-i} + \sum_{i=1}^{12} \alpha_i g(M)_{t-i} + \sum_{i=1}^{12} \gamma_i g(QIM)_{t-i} + \sum_{i=1}^{12} \delta_i g(TCI)_{t-i} + \varepsilon_i dIhG + \mu_t \quad \ldots\ldots(7)$$

Table 10: Combined Theories Specific Model			
gCPI = + 0.7908*gCPI_1 - 0.1518*gCPI_8 - 0.1403*gCPI_12 + 0.2451*gM2_12			
(SE) (0.0492) (0.056) (0.0455) (0.0538)			
+ 0.04011*gQIM_2 - 0.08485*gQIM_10 + 0.2021*gTCI_1 - 0.3545*gTCI_2			
(0.0188) (0.0215) (0.0701) (0.0736)			
+ 0.1762*gTCI_5 + 0.03721*dIhG			
(0.0483) (0.00549)			
Sigma = 0.0083938; DW = 2.19;			
AR 1-5 test:	F(5,55)	=	0.93985 [0.4627]
ARCH 1-5 test:	F(5,50)	=	0.74379 [0.5944]
Normality test:	Chi^2(2)	=	0.94727 [0.6227]
Hetero test:	F(19,40)	=	1.0188 [0.4626]

All the variables have significant t values. The static long run equation is:

Table 11: Combined Theories Static Long Run				
gCPI = 0.488886*gM2 - 0.0892642*gQIM + 0.0472647*gTCI + 0.0742287*dIhG				
(Std.Error)	(0.09416)	(0.04754)	(0.07726)	(0.005826)
(t-value)	(5.19)	(-1.88)	(0.612)	(12.7)
(t-prob)	(0.0000)	(0.0649)	(0.5428)	(0.0000)
Long-run sigma = 0.0167449				
WALD test: Chi^2(4) = 3451.6 [0.0000] **				

The long run sigma value of combined theories equation (0.016) is better than the sigma value of IhGT (0.029) and significantly better than QTM (0.084). In the long run for the combined theories model the growth in money supply and inflation shows a moderate strong relationship. Whereas the output growth and inflation shows a negative sign, which is according to the literature but the relationship is very weak, as identified by McCandless and Weber (1995) i.e. between [-0.10 and -0.34], also the output growth has an insignificant t-value. The variable gTCI have an insignificant t-value in the long run, whereas the variable dIhG have significant t-value. The short run sigma value of QTM, IhGT and combined theories are 0.010, 0.009 and 0.008 respectively. This means that, broad money supply and inherent gap are useful in explaining inflation; however inherent gap is much stronger variable than money and they can be combined in investigating inflation.[35]

[35] More research is needed in this direction.

CHAPTER V CONCLUSION, POLICY IMPLICATIONS AND FURTHER RESEARCH DIRECTIONS

In this thesis, a theory of inflation have been articulated which arises from the very core of the prevailing economic and financial system. Inherent Gap Theory of inflation has been derived from the paradox of monetary profits, in which the economy faces a shortage of money supply in comparison to the total amount of repayable amount. When the system advances a credit, it creates the initial money supply, but it asks in return the credit amount plus interest, where the system never creates the interest amount. In the same manner, for any positive monetary profits to occur it is a must condition that more people are willing to go into debt, in this way more money is created and the equivalence is maintained. If there is any reduction in growth rate of money supply then the economy faces a positive gap, which shows that there is not enough money in the system to pay off all the debts. To safeguard oneself from defaulting or bankruptcy the businesses starts to increase their prices, causing a second fold inflation. During this positive gap the rate of inflation increases as compared to the previous periods in which the gap was negative. In the negative gap period the quantity theory of money will be in action.

For an empirical analysis of this theory Pakistani inflation situation was undertaken with its monetary statistics. The Inherent gap turns positive during the year 2008 onwards and from the same year we experienced a higher rate of inflation. Empirical evidence was presented in support of this theory and statistically all the tests conclude towards the positive effect of Inherent Gap on CPI.

First of all we showed that CPI for the period when IhG is positive is significantly higher than the negative period of IhG. Secondly, we showed that the slope of CPI series

increases significantly for the period when IhG is positive. Thirdly, we showed that long run relationship exists between IhG and CPI. Fourthly, we showed that Inherent Gap Theory of inflation is not encompassed by Quantity Theory of Money on the other hand there is need of cautious statement that Inherent Gap Theory encompasses Quantity Theory of Money as there are some weak evidences in this regard. Lastly, we also formulated a general model which encompasses these two non-nested models.

Policy Implications

The systematic design of the current monetary system and the role of interest is showing problems on many fronts, inflation is only one of the many problems. As this study is in regard to high or second phase of inflation we recommend that the inherent gap must be turned back to its initial negative regime.

For this purpose number of steps can be taken, either the money creation process is boosted or the interest rate is decreased. The money can be created more by encouraging the private sector to borrow more from the banking sector and the share of governmental borrowing be reduced to acceptable levels. The discount rate must be reduced in order to encourage the private sector borrowing.

As these policies recommendations would be helpful in the short run only, a permanent solution which corrects the foundation of money creation process is required to be chalked out.

Further Research Directions

Important steps are needed on the empirical grounds to further clarify this study. Stock data set of Governmental and Non-Governmental borrowing is needed so that the interest rate applied on it, results in more accurate figure of total interest plus credit. Sophisticated calculations are needed to be developed for introducing the KIBOR interest rate and that also of 6-month. Simultaneously T-Bill 6-month auction rate is also important, as its benchmark is more counting towards liquidity. Using stock data set, kibor interest rate and 6 month t-bill auction rate will result in more pinpoint inflation targeting strategies.

BIBLIOGRAPHY

Abdul Qayyum, "Money, Inflation, and Growth in Pakistan", The Pakistan Development Review, 2006.

Abdul Rashid and Fazal Husain, "Capital Inflows, Inflation and Exchange Rate Volatility: An Investigation for Linear and Nonlinear Causal Linkages" PIDE Working Papers, 2010: 63

Ahamed Kameel Mydin Meera, "Ownership Effects Of Fractional Reserve Banking: An Islamic Perspective", Humanomics, 2009.

Ahamed Kameel Mydin Meera, "Part I: Seigniorage Of Fiat Money And The Maqasid Al Shari'ah: The Unattainableness Of The Maqasid", Humanomics, 2006.

Augusto Graziani, "The Monetary Theory of Production", Cambridge University Press, 2003.

Aykut Kibritçioğlu, "Causes of Inflation in Turkey: A Literature Survey with Special Reference to Theories of Inflation", Inflation and Disinflation in Turkey, 2002.

Backus, D.K. and P.J. Kehoe. (1992). "International Evidence on The Historical Properties of Business Cycles." American Economic Review 82(4), 864–888.

Barbara Deleersnyder, "Weathering Tight Economic Times: The Sales Evolution of Consumer Durables Over the Business Cycle", Quantitative Marketing and Economics, 2004.

Bernard Lietare, "Beyond Greed and Scarcity", YES!: A Journal Of Positive Futures, 1997.

Bernard Lietare, "The Story of the Eleventh Round", available online at http://www.lietaer.com/2010/09/the-story-of-the-11th-round

Carlo A. Favero and Francesco Giavazzi, "Inflation Targeting and Debt: Lessons From Brazil", NBER Working Paper, 2004.

Carol Graham, "The Challenges Incorporating Empowerment Into The HDI: Some Lessons From Happiness Economics And Quality Of Life Research", UNDP, 2010.

Charlotte Bruun Et Al, "The Paradox Of Monetary Profits: An Obstacle To Understanding Financial And Economic Crisis?", Economics E-Journal, 2009.

Chevalier, J. and D. Scharfstein, "Capital-Market Imperfections and Countercyclical Markups: Theory and Evidence." American Economic Review 86, 703–725, 1996.

David F Hendry, Massimiliano Marcellino and Grayham E. Mizon "Introduction to Special Issue on Encompassing", Oxford Bulletin of Economics and Statistics, 2008.

Eugenio Gaiotti, "Is There A Cost Channel Of Monetary Policy Transmission? An Investigation into the Pricing Behavior of 2,000 Firms", Journal of Money, Credit, and Banking, 2006.

Federal Reserve Bank of Chicago "Modern Money Mechanics: A Workbook on Bank Reserves and Deposit Expansion", 1992.

Federal Reserve Bank of New York, "I Bet You Thought...", 1977.

Gerald P. Dwyer, "Are Money Growth And Inflation Still Related?", Federal Reserve Bank of Atlanta Economic Review, 1999.

Gottfries, Nils. "Customer Markets, Credit Market Imperfections, and Real Price Rigidity." Economica, August 1991, 58(3), pp. 317-23.

Greenwald, Bruce; Stiglitz, Joseph and Weiss, Andrew. "Informational Imperfections in the Capital Market and Macroeconomic Fluctuations." American Economic Review, May 1984 (Papers and Proceedings), 74(2), pp. 194-99.

Hyman P. Minsky, "The Financial Instability Hypothesis", Working Paper No. 74, The Jerome Levy Economics Institute of Bard College, 1992.

John Maynard Keynes, 1964. "The General Theory of Employment Interest and Money." London, Harcourt Brace and Company. Originally published 1936.

John Smithin, "Weber's "Last Theory of Capitalism" and Heterodox Approaches to Money and Finance", York University, 2009.

Judith A. Chevalier, "Capital-Market Imperfections and Countercyclical Markups: Theory and Evidence", The American Economic Review, 1996.

Klemperer, Paul, "Competition When Consumers Have Switching Costs: An Overview with Appli-cations to Industrial Organization, Macroeconomics, and International Trade."Review of Economic Studies, October 1995, 62(4), pp. 515-39.

Louis Philippe Rochon, "On Money and Endogenous Money: Post Keynesian and Circulation Approaches", Modern Theories of Money: The Nature and Role of Money in Capitalist Economies, 2003.

M.Shaukat Ali, "Analysing Inflation: Monetary and Real Theories", The Pakistan Development Review, 1996.

M.V. Marn, "The Power of Pricing." McKinsey Quarterly, 2003.

Marn, M.V., E.V. Roegner, and C.C. Zawada. (2003). "The Power of Pricing." McKinsey Quarterly 1, 26–40.

Martin Shubik, "A Multi Period Trading Economy With Fiat Money, Bank Money And An Optimal Bankruptcy Rule", Cowles Foundation, Yale University, 1976.

Martin Shubik, "The Theory of Money and Financial Institution: Volume 2", MIT Press, 2004.

Martin Shubik, "The Theory of Money and Financial Institutions: Volume 1", MIT Press, 1999.

Martin Shubik, "The Theory of Money", Cowles Foundation for Research in Economics at Yale University, 2000.

Paul D Grauwe, "Is Inflation Always And Everywhere A Monetary Phenomena?", Scandinavian Journal of Economics, 2005.

Paul Mcculley, "The Shadow Banking System and Hyman Minsky's Economic Journey", PIMCO, 2009.

Rafael Di Tella, "Preferences over Inflation and Unemployment: Evidence from Surveys of Happiness", The American Economic Review, 2001.

Rana Ejaz Ali Khan and Abid Rashid Gill, "Determinants of Inflation: A Case of Pakistan (1970-2007)", J Economics, 1 (1): 45-51 (2010)

Rob Docters, "Pricing For Boom or Bust: Smart Moves for Maximum Flexibility", Journal of Business Strategy, 2004.

Rotemberg, J.J. and G. Saloner. (1986). "The Supergame-Theoretic Model of Price Wars During Booms." The American Economic Review 76(3), 390–407.

Rotemberg, J.J. and M. Woodford. (1999). "The Cyclical Behavior of Prices and Costs." In J.B. Taylor and M.Woodford (ed.), Handbook of Macroeconomics. Amsterdam: Elsevier Science B.V., pp. 1051–1135.

Thomas Greco, "Money and Debt: A Solution to the Global Crisis", 1990.

Yahia Abdul-Rahman, "The Art of Islamic Banking and Finance: Tools and Techniques for Community-Based Banking", John Wiley&Sons, Inc., 2010.

APPENDIX

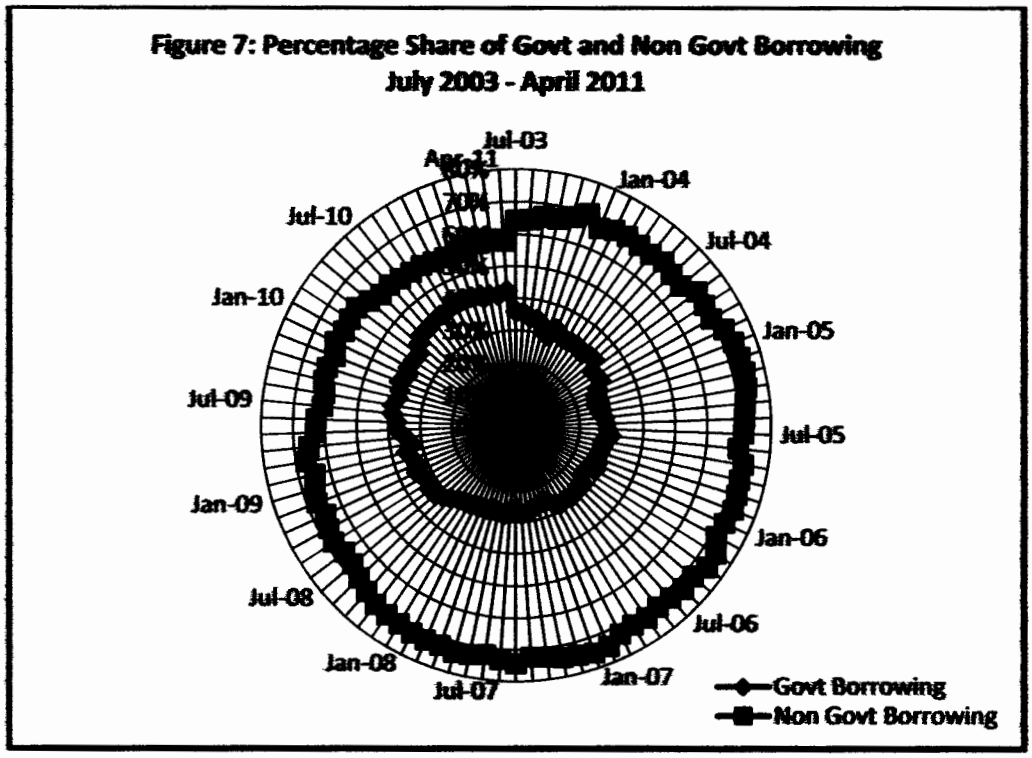


Figure 7: Percentage Share of Govt and Non Govt Borrowing
July 2003 - April 2011
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Govt Borrowing
Non Govt Borrowing

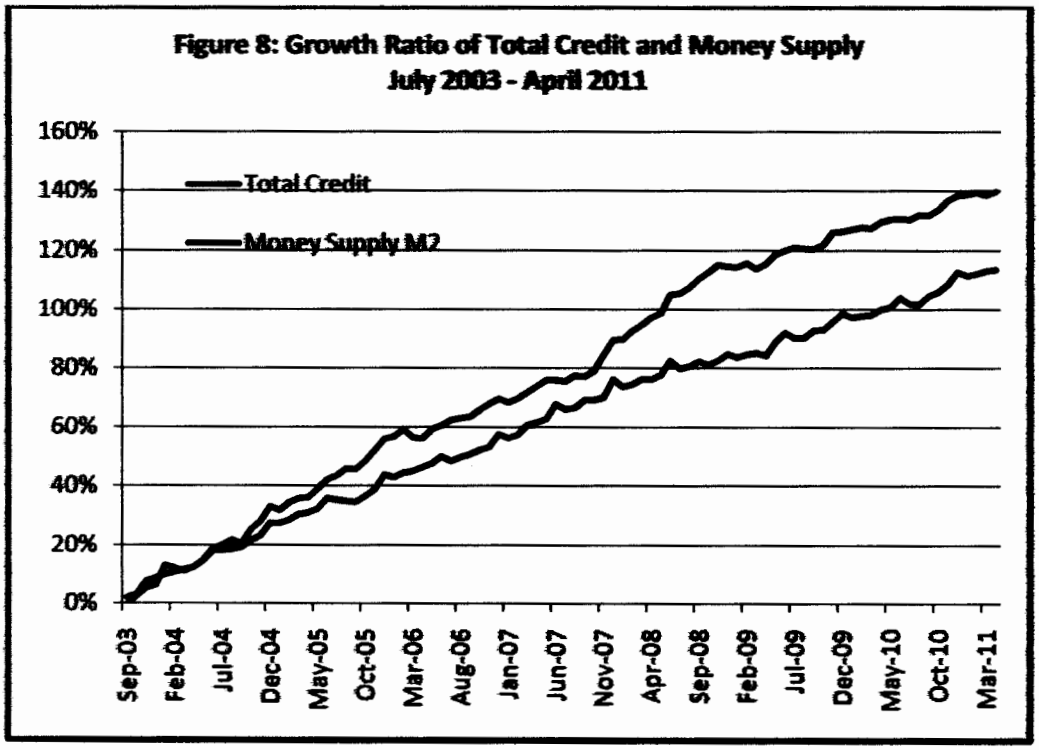
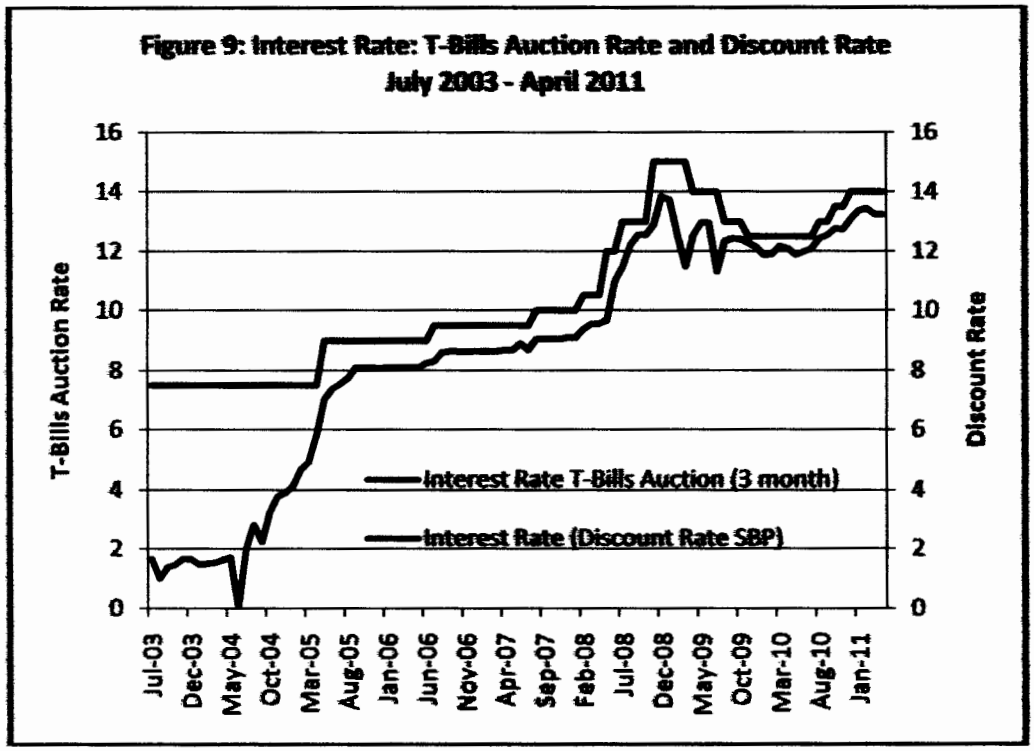


Figure 8: Growth Ratio of Total Credit and Money Supply
July 2003 - April 2011
160%
140%
120%
100%
80%
60%
40%
20%
0%
Total Credit
Money Supply M2
Sep-03
Feb-04
Jul-04
Dec-04
May-05
Oct-05
Mar-06
Aug-06
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11

Figure 9: Interest Rate: T-Bills Auction Rate and Discount Rate
July 2003 - April 2011



Statement of Authorship of MS Thesis

I, Mubashir Mukhtar, student of IIIE, MS Economics and Finance (Regd. No.42-SE/MS(EF)2/F09) solemnly declare and affirm on oath that I myself have authored this thesis with my own work and means, and I have not used any further means except those I have explicitly mentioned in the thesis. All items copied from internet or other written sources have been properly mentioned and with a reference to the source of citation.

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Dhul Qada 1432/ October 2011