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Asad Zaman¹

Abstract

The root cause of current massive and increasing inequality is the power of credit creation by banks. This inequality causes tremendous social damage by destroying democracy, and impoverishing the already poor for the benefit of the rich. The paper provides both theoretical and empirical evidence for the many harmful effects of modern Western financial institutions. Current efforts at Islamization of banking have made only modest cosmetic changes, and left the institutional structure in place. Genuine Islamization requires radical and fundamental reforms of the entire institutional structure. One element of this reform is to eliminate credit creation by Banks, and replace it by 100%reserve banking. This would go along with a host of other changes, creating fundamentally different types of institutions in conformity with Islamic teachings and history. A move to an Islamic system of sovereign money, supplemented by accompanying institutions, has the potential to eliminate interest, inflation, insurance, as well as to reduce income inequality and eliminate speculative bubbles and financial crises. Furthermore, an Islamic system would direct money towards productive investments, lead to increased prosperity.

JEL: Codes: E4; E5; P4

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1. Introduction

There exists an astonishingly wide variety of views among modern economists and (secular) scholars on the nature of modern money. Keynesian believe that monetary policy can lift economies out of recessions, while

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monetarists argue against discretionary monetary policy due to long and variable lags in its effects. Those who believe in the Quantity Theory (and the macroeconomic school of Real Business Cycles) believe that money is a veil and plays no significant role in the real economy. Heterodox economists argue that money is a debt-obligation of the government. Modern Monetary theory or Chartalists have radically different views regarding money. Stephen Zarlenga (2002) provides a historically based argument strongly in opposition to the Chartalists as well as all existing conventional views. A large variety of models for money, such as the overlapping generations model, or the Kiyotaki-Wright model, together with adaptive or rational expectations, provide a variety of possibilities for how money functions in a modern economy. A large amount of research in the area shows that multiple equilibria can exist in such models, leaving conventional economic theories unable to say anything definite about the nature of money. Because of this, the present author has shown (Zaman, August 2014) that even in simplest monetary models, co-ordinated common understandings and agreements about how money works can play an important role in determining the role and function of money within an economy.

Corresponding to this confusion among secular scholars, there is also a wide variety of views among the *Ulema* (scholars of Islamic law) on the nature of money. Prominent among these are views that money is

- 1. A certificate of debt
- 2. A new type of commodity or asset.
- 3. A substitute for gold and silver
- 4. A new type of measure for value of goods (prices) an alternative to gold and silver, without being equivalent.

There exist many arguments in favour of and against all of these views². Opinion among the Ulema has converged on the fourth view but not because this is favoured by *Nasoos* (Quran & Sunnah). Rather, each of the alternate views (like the first three) create problems in the modern economic setup.

²For an extensive discussion and references, see "Paper Money: Its reality, history, value and legal ruling" by 'Abdullah b. Sulayman b. Mani', Qadi in the Makkah Court and Member of the Council of Senior 'Ulama, Saudi Arabia. 1st ed. 1391/1971, 2nd ed. 1404/1984. Translation, Abridgement and notes by Usama Hasan. Another reference which covers similar ground is "Money and Its Usage: An Analysis in the Light of the Shariah" by MoulanaDr. Asmatullah, translated to English by Omar Javaid.

Money becomes not subject to *Zakat*, not useable for trade, not subject to interest and similar problems which do not seem to be in conformity with the role of money in the modern economy.

Even though the current fatwa on money commands widespread consensus among contemporary *Ulema*, it is based on *Hikmah*—it appears most suitable for modern needs. In this paper our goal is to bring out some aspects of the nature of modern money which have generally not been brought out before the scholars of Islam. These aspects require us to re-think the nature of money, and to construct a genuine Islamic alternative to the current system³.

2. On the Importance of Money

The importance of the topic can hardly be over-emphasized. Both Zakat and Interest are rulings of central importance regarding money in Islamic Law; compliance with Islamic Law in these respects, as well as certain others to be discussed later, requires a clear understanding of the status of modern fiat money. Among the many aspects which have not been taken into account in arriving at present *fatwas*, the following are especially important:

- 1. The present monetary system is historically unique; nothing like this has existed in the past history of mankind. This means that Qiyas, or analogic method of reasoning, is likely to fail.
- 2. The present monetary system is an outcome of conscious design, combined with natural historical accidents and an evolution process. One of the leading experts on monetary systems, Williamson (1977) writes that "The Bretton Woods system was easily the nearest thing to a consciously designed international monetary system that the world has yet experienced." This design achieves certain objectives which favour some parties and harm others.
- 3. The existing system is not symmetric between countries the US dollar is now the equivalent of gold, and is used as a reserve currency (replacement for, and equivalent of, gold) all over the world. This means that it can be printed in any quantity, almost without bounds.

³Zaman (June 2014) discusses the spirit embodied in western banking, showing that it represents the urge to accumulate and hoard wealth. This is contrary to Islamic spirit of generosity. The present paper is mainly concerned with a different problem; namely, the private creation of money by banks via the process of interest based lending.

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Other currencies do not enjoy this privilege. This asymmetric system strongly favours the USA, and leads to the following problems for Muslims:

- a. It is possible for the US to exchange paper for real resources throughout the world, like oil, human capital, votes, social and political influence.
- b. The Iraq war was almost entirely financed by printing trillions of dollars, an un-imaginably large amount of money. If the whole world did not consent to the use of dollars, the war would have been impossible for the USA to finance. This is called "seigniorage" – a privilege enjoyed by the creators of money.
- c. The printing of dollars imposes an inflation taxon the rest of the world, which holds dollars as reserve in their central banks, and for personal and institutional use. Thus USA can earn revenue from the rest of the world effortlessly, under the current system.
- 4. The tremendous privilege of creation of money enjoyed by the USA permits it to dominate the globe. Mahathir Mohammad suggested that refusal of Middle Eastern countries to accept dollars for oil would be sufficient to cause a collapse of the USA Economy. It has been suggested that a reason for the Iraq war was Saddam Hussein's proposal to create an oil-based currency, which would have had similar effects. Knowing whether or not this is true requires access to confidential top level discussions within US leadership; however, there can be no doubt that the current monetary system is of tremendous value to the USA and therefore it is worth a great deal to the USA to try and preserve this system, and to fight any attempts to change it.
- 5. One of the reasons for the many confusions about money that currently prevail is that it is very strongly in the interests of the powerful to not let the world learn about the mechanisms which create this power. Learning these mechanisms provides access to methods by which this power can be attacked and destroyed. Nonetheless, recent damage caused to global economy by the financial crisis of 2007-8 has led some to make some interesting disclosures. For example, Ahiakpor (2001), Fontana and Palacio-Vera (2003), and McLeay, Radia and

Thomas (2014) show that the reality of money creation differs from the description in textbooks.

Because of all of these reasons, it is important to learn about the complex current monetary system. Rulings based on Islamic law require such detailed knowledge. In particular, is it worth preserving this system developed by conscious design to help some and hurt others? In this context, Hickel (2013) documents that about 136 billion dollars in foreign aid flows from the rich to the poor countries. At the same time, about 600 billion dollars in interest payments (often financed by additional loans at high interest) flow from the poor countries to the rich. In addition, rich countries acquire about a trillion dollars of capital flight from the poor; this including repatriations of capital by multinationals, as well as Swiss accounts of corrupt rulers. This massive exploitation of the poor by the rich is supported by the current monetary system and could not occur without our agreement to accept this as a permissible system for use within Islamic countries.

3. A Central Problem: Fractional Reserve Banking

The problem that we wish to discuss is quite complex, in parallel with the modern monetary system itself. Therefore, it is useful to start with an analysis of the problem in a simpler context, where the problem actually originated. Before starting the analysis it is important to point out that the focus of our analysis is an area which has been ignored by most Ulema. central banks publish two measures of money in the economy, M0 and M1. M0 is the amount of cash in circulation, which is also called narrow money or high powered money or the monetary base. M1 is the monetary base plus the amount of demand deposits at banks. Typically M1 is much higher than M0, often up to ten times. *Ulema* have focussed on the nature and legitimacy (or otherwise) of M0, which is unbacked fiat currency. That is, is it permissible for the government to issue notes promising payment on demand, when there is in fact nothing to be paid, except another note just like the first? However, we do not discuss this issue at all. For the sake of argument, we may take the current fatwa to be correct with regard to M0. Government has the right to issue paper currency, and no problems are created by the "fiat" nature of money - that is, lack of gold backing is not a problem. Our focus is on the issue of the difference between M1 and M0. The demand deposits in banks which are also counted as money by all participants in the economic system are quite different in nature from the cash which is M0. It is the legal status of these demand deposits, which form the major portion of money, which we wish to

discuss. Unfortunately, modern monetary textbooks treat both M0 and M1 as being exactly the same, when in fact these are radically different as we will explain. To differentiate the two, we will call the difference between M1 and M0 as bank-created money, or demand deposits; this is the extra money over and above the high powered money M0 printed by the Central Bank. Because economists have treated the two as the same, Ulema who have learned about the nature of modern money from economists have not considered the issue that these are actually very different. Based on considerations to follow, it seems likely that bank created money would not be permissible under Islamic Law, while fiat currency in the form of notes printed by the government would be permissible. If our arguments are correct, then the entire banking system needs to be radically reformed in order to make it Islamic.

3.1 Origins of Paper Currency

The complexity of the modern monetary system makes it worthwhile to study its simple origins, which share important common features. In 16th century Europe, goldsmiths (bankers) would issue paper certificates to depositors for gold deposits. These certificates were also used for trading purposes. Goldsmiths found that a large percentage of gold deposits entrusted to them were sitting idle for long periods of time. In order to make profits, they started lending out these gold deposits at interest, without knowledge or permission of the owner. The mechanism for these loans was the issuance of a certificate to the borrower, exactly like the ones issued to those with gold deposits. This transaction is very similar to the operations of the current system of fractional reserve banking; therefore it is worth considering its status within the framework of the Shariah. Instead of providing a ruling, we merely provide some details about the nature of the transaction:

- 1. The goldsmith does not actually lend gold; he issues a certificate to the borrower which states that the borrower can obtain gold on demand from the goldsmith. There is an element of fraud in this, since the goldsmith does not actually have enough gold to satisfy all claimants.
- 2. What is lent is just a promise to pay gold, embodied in a certificate. Interest is charged on the loan, when in fact, nothing substantive has actually been given to the client.
- 3. If certificates circulate just like gold, then the goldsmith has actually created money, and added to the stock of available money in the

economy. If money creation is a prerogative of the government, then this act violates this privilege.

4. The system is such that the creation of interest-based debt is essential and central to the functioning of the system.

3.2 Modern Banks

Modern banks function just like the goldsmith described above. The only difference is that they use deposits of CASH (M0) instead of gold. For instance, the liquidity ratio required from banks is only 15% in Pakistan, so with deposits worth 1000 PKR, they can make loans (and create money) up to 6,600 PKR. This may surprise the reader who is not familiar with bank operations. How can the bank loan amounts greater than what it has in terms of cash deposits? What would happen if people asked the bank for cash?

First, large depositors typically do not ask for money in terms of cash. Most people do not want to hold large sums of cash, while the banks are well equipped to store the money safely. What can and does happen is that people can transfer large amounts of money from one bank to another as part of transaction with some other party. There are many banks and on the average these transfers balance out - some are transferring money from bank X to Y and Z, while at the same time money is being transferred from Y and Z to X as well. There is an inter-bank clearing agency which does all the calculations at the end of the day and provides the net effect of all transactions on the change in deposits for any bank. This can lead to short run fluctuations where some banks end up with the need to pay other banks more cash than they have on hand. Note that in the long run, the bank is solvent – it will get back the money from the loans, plus interest, and therefore will be able to pay back the depositors. To handle short term lack of liquidity, the bank can borrow from the other banks (when one bank is in deficit, some other must be in surplus). It can also borrow from the central bank. In typical course of affairs these transactions cancel out, with banks borrowing money when they need it, and loaning it when they have a surplus. When there is a loss of confidence in the system as a whole and people start withdrawing money from all banks at the same time, then a banking crisis can occur. In these situations (which occur from time to time) it is the job of the central bank to step in and loan money to banks to ensure that they can make payments, and prevent a panic. In fact, an important role of the banking system is to create confidence that people will be paid – this confidence by itself is enough to stop a panic.

There are three issues to consider here:

- 1. Is the bank permitted to loan money which it does not have, utilizing the fractional reserve banking system? Banks create demand deposits, which entitle owners to receive money from the bank on demand. Bank cannot meet all demands which it promises to fulfil.
- 2. Permitting this method leads to the creation of money by private banks. By issuing loans of \$1000, they create demand deposits of \$1000 which is in addition to the cash deposits of \$100, thereby greatly increasing the supply of money in the economy. So question is: Is it permissible for banks to have the power to create money?
- 3. The banks have incentive to create money make loans on the basis of their deposits only because of interest based loans. Islamic banking provides formal/legalistic alternatives to interest, but the basic operation is the same utilization of depositor's money to make risk free loans.

These are questions for the Ulema to consider. As an economist, what I would like to do here is to study the effects of this banking system in practice, as it has functioned in advanced capitalist countries. I will show that the system is very harmful in many ways. For this reason it is not necessary for us to try to create Islamic banks – what is the point of trying to create an Islamic version of an institution that is not beneficial for the society?

4. Lessons from Experience of Banking in these

We now summarize some of the lessons that the experience of banking in USA reveals very clearly. This is based on the highlights, which are three major banking failures in the USA.

4.1**Three Major Banking Failures**

First event: The great depression of 1929 was caused by the collapse and failure of banks, and resulted in prolonged misery for millions of people in the USA and elsewhere. This led to strong regulation of banks, and a period of stability for the banking industry, which lasted about fifty years. This led to prosperity and growth in the USA, but with a reduced role for the banking sector, and less power for the wealthy.

Second event: The Saving and Loan Crisis of the 1980's. The wealthy elites (The military-industrial complex and the multinationals) staged a revolt against regulations on the financial industry. This led to a partial de-regulation of one segment of the banking industry, namely the Savings and Loans (S&L) Associations. In a duplication of the events leading to the great depression, the S&L Industry gambled with the depositor's money, leading to colossal losses of about 124 billion dollars. However, this time the government did not allow the banks to collapse, but bailed them out. The entire cost was borne by the taxpayers, and this was larger than the entire gains from the banking industry over the fifty year period of stability.

Third event: The global financial crisis of 2007-8. Despite bad results, the wealthy had enough political power to continue the process of de-regulation of banks started in the 1980's. Previous regulatory measures were repealed and the banks were given freedom to gamble on derivatives. Attempts to regulate this gambling were defeated in the legislature. This led to money creation and gambling by banks on a scale never before seen in the finance industry. On a planet wide basis, the money in gambles was ten times that of the money in real transactions. The main reason for this massive increase in gambling was that the banks were allowed to gamble with other people's money, and also to create money for the purpose of gambling. Furthermore, insurance existed which made these gambles almost risk free – if the banks and financiers won, they pocketed the gains; if they lost, the insurance would pay for the loss. This fraudulent system eventually collapsed, and led to losses measured in trillions of dollars.

These three were among the biggest, but Barro and Ursúa (2009) enumerate 232 stock market crashes and 100 depressions during the twentieth century. Overall, the historical experience show very clearly that the banking and finance industry has been a source of major harm and damage to society. It also seems that regulation is of crucial importance – well regulated banks can contribute to prosperity; while un-regulated banks lead to crises. This lesson requires deeper examination, which will be done later. In the final analysis, although there have been some benefits, the overall cost to society from the modern banking system has been much higher. See in particular, the presidential address of Zingales (2015) on the topic "Does Finance Benefit Society?" He concludes that while finance does offer some benefits, it can also cause serious harm. We now turn to the root cause of the problems with current institutional structures for finance.

4.2 Effects of Private Money Creation

The modern banking system effectively places control of money creation in the hands of the wealthy. This has a lot of extremely harmful effects, which we now review.

4.2.1 Concentration of Wealth

Money creation by banks occurs when they give loans. The larger the loan, the more money is created. In an efficient system, banks would give loans to projects which had the greatest potential for high productivity. This way, the money would be used to finance useful projects, beneficial to the nation as a whole. This would be especially true for loans given on a Musharka basis, where the bank has a strong vested interest in productive outcomes of the project. However, the current system for loans is collateral based. If a poor person with an excellent project asks for a loan, he will not get it. If a wealthy person asks for a loan for a useless project, he will get it because he has the collateral to guarantee repayment regardless of whether or not the project is successful. This has several important implications for the financial system. The wealthy have almost unlimited access to wealth, since loans are granted to them via money creation by banks. The poor have no access to financial institutions; even for their emergency needs, they rely on the informal sector which charges 100% where banks are charging 10%. This system is already biased towards wealth creation for the already wealthy. However, supporting financial institutions make the effects even worse, as we shall soon see. The extreme concentration of wealth that has occurred in capitalist economies has been extensively documented in many sources. Most recently, the analysis of Piketty (2014) provides a systematic analysis of the tendency towards accumulation of wealth in capitalist economies. Even the IMF, which has been a strong advocate of financial liberalization, has admitted that global financial flows have been destabilizing, and have created crises and inequality, without contributing to growth – see Ostry et al. (2016).

4.2.2 Insurance, Derivatives, Property and Stocks

According to false but dominant economic theories, it is a good idea to provide financing to the already wealthy, because they will invest it in highly productive projects. Their existing wealth shows their ability to successfully generate wealth. In contrast, the poor will utilize money for consumption, instead of adding to productive capacity of the economy. Indeed, additional

arguments are made that helping the poor leads to them become lazy and unwilling to work. This deprives the industrialists of the labour force needed to run factories, and makes the nation poorer as a whole. These theories have been successfully propagated by the wealthy, and are now part of standard textbooks on economics. They have also been implemented in policies which provide tax cuts to the wealthy and balance the budget by reducing support for social welfare programs for the poor. The ground reality of what the wealthy do with their additional wealth is substantially different from the textbook pictures.

We can classify investments into two types: speculative and productive. A productive investment builds factories, creates services, and generally adds to the productive capacity of the economy. A speculative investment in property or stocks is just a gamble that the price of the asset will rise, leading to an increase of wealth, without any change in productive capacity of the economy. Just as economic theory does not differentiate between M0 and M1, so economic theory does not differentiate between gambling and investment. Failure to differentiate is extremely helpful in protecting the interests of the wealthy, and in giving the appearance of truth to theories described in the first paragraph.

Careful research shows that over the past thirty years, the wealthy have gained a tremendous amount of wealth. But this gain has not been due to productive investments. Rather it has been due to speculation and gambling on property and stocks. Of course, such speculation is risky - stocks and property values can go up and down. However, the wealthy have devised clever methods to eliminate these risks. Suppose I provide a large mortgage loan to someone to purchase property; the mortgagor promises to pay the amount in small instalments over thirty years. At the same time I can buy (rather, force the borrower to buy) mortgage insurance; this insurance will make payments if the mortgagor is unable to do so. After the insurance, my investment is risk free. Derivatives perform the same function for stocks. I can buy a stock expecting it to go up. At the same time, I can buy a derivative which covers my losses in case it goes down. Through rather complex and often hidden mechanisms, wealthy investors can gamble on huge sums of money in a virtually risk free fashion. Furthermore, private creation of money by banks provides them with unlimited amounts of money to do so.

4.2.3 Regulation and Ratings

In principle, regulations can control many of the problems described above. If banks evaluate the investments properly, and distinguish between speculative and productive investments, they could guide the economic system towards good outcomes. Similarly, rankings of financial soundness play an important role in permitting investors to differentiate between good and bad institutions. These rankings encourage institutions to maintain sound portfolios and avoid excessive speculation. Similarly, insurance companies should screen mortgagors and provide insurance when the borrower has sound and reliable sources of income, and refuse to provide insurance when the borrower is likely to fail in repaying the loan. All of these safety mechanisms were in operation and functioned fairly well in the Keynesian era. However, these same mechanisms became dysfunctional in the post-Keynesian era, for reasons to be explained. The global financial crisis was caused by both the removal of regulatory laws and mechanisms, and the dramatic failure of the regulations which remained.

As already discussed, the climate was in favour of de-regulation. The Gramm-Leach-Bliley act of 1999 repealed the Glass-Steagall act, and permitted banks to invest in stock markets, and make all kinds of speculative investments. Similarly, the Commodity Futures Modernization Act of 2000 blocked efforts to restrict and regulate the use of derivatives. These de-regulations, plus the availability of insurance, and the purchase of regulatory agencies, led to a wild gambling spree on the part of banks. It did not take long for this to collapse the economy in the global financial crisis of 2007.

4.3 Clever Strategies of the Wealthy

The fabled King Midas could turn anything he touched into gold. The ability of the wealthy to borrow unlimited amounts of money using their wealth as collateral, and the ability of banks to provide them with this money by simply creating it, gives the wealthy the opportunity to manufacture money in ways not available to ordinary people. One of the core principles of an Islamic economy is that earnings should be "Halal". This typically means that the money earned must be deserved on the basis of producing something of value, or of providing some useful service. However, in the modern economy, the wealthy can earn vast amounts of money without doing anything useful or productive. We give three examples of how the wealthy become much wealthier by the use of financial strategies. One example is the leveraged buyout used to purchase entire companies. The investor needs only about 10% of the worth of the company he plans to buy. The additional 90% is taken as a loan from the bank, and the assets of the company being bought is used as collateral for the loan. Thus, with a little money and little risk, the already wealthy can use the money to acquire productive assets. After acquiring control, they can get a much greater share of the revenue produced by the company, by reducing the share going to the workers. Indeed, the data show that the number of acquisitions – buyouts of firms – has increased tremendously over the past thirty years. Also the amount of profits of the firm going to the workers has remained fairly constant (not increased, or decreased) while the share going to the owners has increased tremendously.

The second example is that of mortgages. These were once the safest types of loans. The banks made loans to people to buy houses, and repay the loan on instalments. The house itself served as collateral, providing a guarantee of the loan in case the borrower was unable to make instalments. Nonetheless, very careful checks were made in order to ensure the ability of the borrower to make regular payments. However, the scenario changed completed after de-regulation. Almost anybody who applied could get a mortgage and buy a house, with no questions asked about ability to pay. Previously banks used to ask for 20% of the price as down payment. However, in modern times, the borrowers were only asked to pay the first instalment and *also to buy* insurance for the mortgage. In this way, the banks were covered whether or not the borrower was able to pay. When a lot of these guaranteed-to-fail mortgages were issued to borrowers who did not have enough income to make the payments, the insurance industry suffered huge losses. The world's biggest insurance company (AIG) was unable to make the payments to cover all the losses. This insurance was the core which held the entire financial system together. Failure would have caused a collapse of the whole system. Therefore the government stepped in to provide funds needed, and prevented the collapse. Thus, the wealthy made tremendous amounts of money, and did not suffer any loss when the system collapsed.Mian and Sufi (2014) have documented the deliberate provision of credit to those with low credit ratings, and how this led to increased assets of the wealthy, as bankruptcies transferred wealth to the lenders.

The third example is the manipulation of stock prices, and also other asset prices. By pooling wealth and buying a stock (or any other asset) an illusion of increasing prices can be created. This illusion tempts others to buy, at which point the manipulators can sell their stocks at artificially inflated prices and make huge profits by deceiving others. Similarly, the wealthy can combine to speculate against currencies. If all start to buy up a given currency at a given exchange rate, the exchange rate can increase, leading to vast profits on the earlier purchases. Many central banks do not have enough assets to defend themselves against such speculative attacks. Similarly, in an amazing episode which concluded on Silver Thursday, the Hunt Brothers tried to buy all the silver stocks in the world market. They bought more than 50 billion dollars' worth of silver, and two thirds of the entire world stock, and failed to capture the market only because the US government intervened. This kind of manipulation and insider trading is routine on a smaller scale, and is only possible for the extremely wealthy. See Stewart (1992, Den of Thieves) for detailed documentation of many such episodes.

5. Problems with Private Creation of Money

Before we can discuss solutions to the problems described above, it is necessary to state the problem clearly. The main problem is the creation of money by private banks. This created money is M1-M0, the demand deposits over and above the amount of cash in circulation. Typically, private money creation is ten times more than the creation of money by the government, but it can be much greater than that at certain times. We have discussed the reasons why this private creation of money leads to problems above. Here we summarize the discussion and present some additional facts of importance.

5.1 A Crisis Prone Financial System

Because of the system of lending at interest to those with collateral, the wealthy have almost unlimited sources of finances. With huge amounts of money, they are able to manipulate the government, financial institutions, corporations, and individuals, all to serve as their instruments for making even more money. The financial system is inherently unstable because the wealthy extract more and more money from the productive sector of the economy, without providing any productive services to society. As a result, the productive sector eventually collapses, leading to a crisis. However, the extremely wealthy can protect their wealth even during a crisis, and often make even more profits because of the crisis. Thus they have no incentive to change the system. After the global financial crisis, many efforts have been made to reform the system to prevent such crises in the future. However, all such efforts have been successfully blocked with the result that almost

exactly the same financial system remains in operation. As a result, many analysts have said that another crisis is inevitable, as no changes have been made to prevent it.

Marvin Minsky (1992) has provided a deeper analysis of the failings of the financial system, called the financial fragility hypothesis. This is too complex to explain in detail here, but a rough sketch is as follows. When the economy is expanding, productivity rises, asset prices increase, and stocks appreciate. In such situations, money can earn good returns, and hence there is an incentive for private creation of money. Those who can, borrow money to invest in rising stocks and properties, as the interest they have to pay is lesser than the profits they can make. But this expansion makes the stock and asset prices grow even faster. As the stock prices rise higher and higher, this expansion becomes unsustainable and eventually collapses, leading to a financial crisis. Once the crisis takes place, there is widespread unemployment, prices crash, and losses and bankruptcies occur. In this scenario, there is not much private return to be made on money and the banks create much less money than they would in a normal economy. However this further prolongs the crisis and delays recovery. As per Keynesian ideas, we need to add money to a depressed economy to recover, and we need to reduce money supply in an expansionary economy to prevent inflation. The private creation of money does exactly the opposite.

5.2 Illusions Created To Sustain the System

This system which siphons wealth systematically to the rich needs several types of mechanisms to support it and keep it running. At this time, the top 85 individuals in the world have more wealth than the bottom three billion⁴. Many of them have personal budgets bigger than that of many large and populous African and Asian nations combined. Since the wealthy live in rich countries which are typically democracies, it is important for them to ensure that the real economic mechanisms at work are not apparent to the public. The public must in general support policies that are in fact harmful to 99% and serve the interests of a tiny minority. This support is obtained by many means. Hermann and Chomsky (2008) have documented the control of the media by the wealthy, while Palast (2003) documents how wealth is used manipulate

⁴This was true in 2013, when the paper was written. According to latest statistics by OX-FAM, only 62 people now own half of the global wealth. This show the amazing rapidity with which wealth is accumulating at the top.

politics in "The Best Democracy Money Can buy". In the past, donations to candidates for presidential elections were restricted in many ways, to equalize chances for all, and prevent the buying of candidates. Recently, these restrictions have been removed, in effect legalizing bribery⁵. There are many documented cases of huge funding for candidates by corporations, with return favours by the elected candidates. Research by Gilens and Page (2014) shows that on issues where majority public interest's conflict with those of the elite, the elite prevail in political policy making.

Our concern in this section is the propagation of false economic theories through the medium of education and research. These theories support and advocate favouring the wealthy, and hide the ugly aspects of the mechanisms currently in existence.

5.2.1 Mis-measures of Wealth

The private creation of money, and the risk free gambling mechanisms do not add any productive value to the economy. This was well known to classical economists who differentiated between rents accruing from ownership of capital and investments leading to productive returns. Rents were frowned upon, and proposals to tax them away were prominent. For example, Keynes (2006) proposed that low interest rates would prevent renters from making profits just from capital: "(low interest rates) would mean the euthanasia of the renter and, consequently, the euthanasia of the cumulative oppressive power of the capitalist to exploit the scarcity-value of capital."

The renter class fought back by arguing that they create "wealth". The standard economic measures of wealth treat artificial money created by speculation and inflated stocks as equal to wealth created by the genuine production of goods and services. Conventional economic theory, as taught in textbooks all over the world, does not recognize any difference between financial wealth and real wealth. To understand the difference, it is useful to note that just before the global financial crisis the value of derivatives (all of which are gambles on stock prices) was ten times the value of production on the entire planet. This value was rapidly destroyed as stock prices plunged,

⁵Democracy 21 president Fred Wertheimer, a long-time advocate for election money reforms: "The court re-created the system of legalized bribery today that existed during the Watergate days."

without any change in productive capacities, showing that this financial wealth was an illusion.

The same situation prevails currently. By mis-measuring wealth using financial assets, and by using averages instead of medians, one can paint a rosy picture of the current state of the US economy. \$12.9 trillion in new wealth created in the United States in 2013 trumps the \$12.3 trillion residents lost during the financial crisis, and the country now has nearly half of the world's ultra-high net-worth individuals, defined as those with assets worth more than \$50 million. However, from the perspective of the bottom 90%, the economic situation looks bleak, with homelessness, hunger and unemployment at record levels, and declining incomes and income shares for the majority of the working class and middle class citizens.

5.2.2 Hiding Costs and Inequalities

Recently Nobel Laureates Sen and Stiglitz (2009) have compiled a large list of shortcomings of GDP as a measure of wealth. Importantly, the destruction of environment, and irreversible depletion of the planetary resources, is not counted as a cost, while the profits corporations make from this destruction is counted as a gain. Again this makes it appear that wealth is being created, when in fact it is being destroyed. See Zaman (2014) for an evaluation of the costs and benefits of growth over the past century.

Leading economic textbooks make no mention of contemporary dramatically increasing inequality. Discussions of income distribution are carried out in highly technical and theoretical terms, and treated as peripheral to the main issue of wealth creation. Nobel Laureate Lucas (2003) discouraged exploration of these questions: "Of the tendencies that are harmful to sound economics, the most poisonous is to focus on questions of distribution". Many textbooks explicitly or implicitly advocate the trickle-down theory, which states that as long as wealth accumulated, all will benefit from it. Thus, we need not worry about the concentration of wealth in the hands of the wealthy. Thus an illusion of prosperity and growth is created even now, when in the post crisis USA, homelessness and hunger are at highest levels seen since World War II.

5.2.3 Wrong Descriptions of Creation and Control of Money

Most current economic textbooks flatly deny that banks create money. They all assert that the government creates and controls the money supply. The banking system multiplies the money created by a mechanical process. Banks do not create money. Thus, the central problem we have described above, namely the creation of money by banks is denied. In recent times, the gains going to the super-rich have increased so tremendously that even the very rich have been left behind. As a result, some of the rich and powerful have started to reveal the truths about the current monetary system. One of these recent revelations is by McLeay et. al. (2014) published by the Bank of England. Clearly this is an authoritative source with intimate knowledge of money creation. This report clearly states that the reality of how money is created by private banks is entirely different from what is written in most textbooks. It describes how the idea the government creates and controls the money supply and the private banks simply lend money which they receive as deposits are two common misconceptions which hide the reality of private money creation by banks. Historical evidence and theoretical frameworks to replace the myth of money creation by the central bank are provided in Ahiakpor (2001), Fontana and Palacio-Vera (2003), and Zarlenga (2012).

5.2.4 The Myth of Financial Intermediation

The Function of Financial Intermediation: It is widely believed that banks function as financial intermediaries. They collect large pools of funds from the small savers and channel them to investors. By making money available to investors, they perform a vital economic function. However, as stated by McLeay (2014), this intermediation function is a myth. The main function of banks is provision of money to the already wealthy via a process of money creation. In fact, the ratio of "cash" or M0, to broad money averaged over 6 across all countries in 2000, showing that banks create five times as much money as they receive in deposits. Obviously, if banks only lent what they received (intermediation) this would be impossible.

5.3 Regulatory Capture

It has often been suggested that the problems with the banking sector described above can be solved by regulations - laws to prevent behaviour which is harmful to the public. In fact the fundamental problem is that money creation by banks is legal, and the only way to regulate this is to change the entire

system in radical ways. This kind of solution will be discussed in the next section. Without making such radical changes, attempts to regulate the system are doomed to fail. That is because those being regulated have the power to create money, which provides them with enormously greater resources than the ones doing the regulation. In this uneven match, the regulator often loses; this problem has been termed "regulatory capture". Some examples are given below to illustrate.

To cite just one example out of hundreds, we consider the case of the CFTC – Commodity Future Trading Commission. This was designed to be an independent regulatory agency to protect consumers from fraud, manipulation, and abusive practices. In 1988, Wendy Gramm was made chairwomen of the CFTC. As chairwomen, she exempted Enron from regulation in trading energy derivatives, which later became the source of one of the biggest financial scandals of the 20th century. Later, after exempting Enron from regulation, she joined the board of directors of Enron at a very lucrative salary. Bruce Levine, one of the judges handling cases at CFTC was directed by her to never rule in favour of complaints about malpractices. He faithfully complied with this directive, as reported by his fellow judge George Painter.

Matters have progressed far beyond regulatory capture. As the strength of the financial sector has grown, they have captured the bodies responsible for making laws about regulation - the Congress itself. The Glass-Steagall act was a simple affair of about 30 pages, simply and clearly banning banks from investing in the stock market, and other risky ventures. The repeal of Glass-Steagall in 1999 played an important role in allowing banks to undertake risky gambles with created money, and led to the global financial crisis (GFC) of 2007-8. This led to the widespread recognition that something like Glass-Steagall was necessary to prevent future crises. However, the replacement that was enacted, the Dodd-Frank act, was a 300 page monstrosity full of loopholes which would allow banks to circumvent the regulation. Many such attempt to create regulations to prevent future crises were either blocked or rendered ineffective in the Congress. The result is that nothing has been done to address the causes of the GFC; this is because the GFC actually helped the finance industry to greater profits via trillion dollar bailouts (again an instance of governmental capture), while causing enormous damage to all other parties.

The actual amount of power and wealth wielded by top executives of multinational is kept as a carefully guarded secret. The wealth of the world's

billionaires now stands at \$7.3 trillion, an increase of 12pc from last year, according to a new report released September 18 by Wealth-X and UBS. There are a record 2,325 billionaires in the world, up from 2,170 in 2013 and 1,360 in 2009, the first year following the financial collapse. The public is quite unhappy with the perceived inequalities, while the public perception of inequality is far less than the actual inequality which prevails. Kiatpongsan and Norton (2014) found that Americans believe CEOs make roughly 30 times what the average worker makes in the U.S., when in actuality they are making more than 350 times the average worker. "Americans drastically underestimated the gap in actual incomes between CEOs and unskilled workers," the study says. Also, this gap between public perception and reality is the highest in the USA – the same gap exists in other countries of the world, but is less dramatic. It is also important to note that this gap has widened dramatically over the past 30 years, directly as a result of financial de-regulation which has given increasing wealth and power to the elites. The ratio of pay of top executives to average worker has gone from 30 to 1 in the 70's to 300 to 1 in the new millennium

6. An Islamic Plan

Now that the nature of the problem is understood, we can discuss how it might be solved. First note that Muslims have in general been looking for solutions at the wrong level. Assuming that banking system performs valuable functions they have sought to retain the banking system while changing those parts which are in conflict with the Sharia. This cannot work since what we really need is an alternative to the banking system itself. Following the Great Depression, a set of leading economists analysed the failings of the system, and came to the some of the same conclusions that we have described above. They realized that the only solution was to prevent money creation by banks, and to return this power to the government, where it belongs. In order to accomplish this, they created the "Chicago Plan" which would transform the existing banking system to eliminate fractional reserve banking, replacing it by 100% reserve banking. There are many complicated details involved in making the transition in a smooth fashion, so that the economic system continues to function. What is important to understand is that the financial system is a co-ordinated and coherent system, where all parts function in harmony. Therefore, making partial changes in one part is unlikely to work. Below we present system wide changes which would be required to bring the financial system in harmony with Islamic principles. We adopt some aspects

of the Chicago Plan, mainly the 100% reserve banking system, and add many other aspects which are important from the Sharia perspective.

Historically, in the USA, the plan generated a lot of interest, and was discussed at the highest levels. Eventually it was defeated by the financial powers, as it was extremely harmful to their interests. Similarly, there has been a revival of interest in the Chicago Plan following the global financial crisis. However, it is highly unlikely to be adopted, since the financial lobby in the West has much more power today than it did in the post-depression era. However, the situation is different in Islamic countries. If Muslim leaders, *Ulema*, and intellectuals understand the issues, it would be possible to change the monetary system towards a 100% reserve based system. The domestic financial powers are not yet strong enough to capture the governments. The global finance industry is very strong, but may be thwarted by appropriate strategies based on domestic interests. Nonetheless, it would be a tough battle. The first step in the battle is to get a clear understanding of the issues involved.

As discussed in my earlier paper Zaman (2014), we would need several different types of specialized institutions to replace the current homogenous banks. We would need several different types of banks, for current accounts, savings accounts and investment accounts. In principle, many of these could be combined – that is housed in the same building, or as different departments of the same unit. However, since they perform entirely different functions, we discuss each of them separately. We outline the financial institutions of an Islamic economy below.

6.1 Darul-Amanah

These institutions are the equivalent of current accounts today. The deposits are demand deposits, which means that they are available any time the depositor wants. These will be purely for the safekeeping of money. In additions, they could facilitate transfers of money, purchases via debit cards, and many other currently familiar transactions utilizing checks and checking accounts. The main object of these banks is to provide for liquidity.

In existing banking structures, the bank provides these services either for free, or for nominal charge. This is because the deposited money allows the bank to create private money up-to ten times the amount of the deposit. Profits on this created money compensate the bank for the cost of the services provided. In a 100% reserve banking system, the bank would not be able to create money on the basis of the checking account deposits. One option is that the bank could charge a service fee for the provision of services. However the second option may be superior. This is to allow the bank to borrow money from the government in a fixed proportion to its deposits – for instance at the ratio of 10 to 1. During the transition period, the ratio should be set to be equal to the amount of money created by the bank, so that minimal disturbance in the money supply occurs. The money supplied by the government could be a zero interest loan, or it could be on basis of musharka to comply with the Sharia.

In effect instead of allowing the bank the privilege of private creation of money, the money will be created by the government and loaned at zero percent interest to the bank. The advantage of this is that the liquidity of this new system will be the same as that of the fractional reserve system – If the bank is prohibited from creating money, and nothing is done to replace it, that will cause a severe contraction in the overall money supply and lead to a recession. Another advantage is that the government now has two instruments for precise control of money supply – it can fix the ratio at 10 to 1 or higher or lower amounts depending on the liquidity required by current economic conditions. It can also vary the rate of Musharka profit share given to the government from a base of 50% to higher or lower values, depending on the demands of the economy at the time. The money which can be borrowed from the government by the Banks may be deposited in Savings Banks described next; unlike current accounts, these accounts earn a small profit for the depositor.

Since there is no chance of bank runs in a 100% reserve system, the depositor's money is always safe. However, there is an inflation risk attached. As we will explain later, it is likely that inflation will be much lower in an Islamic economy. Nonetheless, if inflation does occur, it is possible for the government compensate the depositors. This is because the government is the guarantor of the value of money. Any losses suffered by depositors due to fluctuation in the value of money can, in principle, be compensated by the government. We do not discuss details of how this could be done, since at the moment we are only interested in providing a broad outline of the plan.

6.2 Savings and Loans Institutions

The second type of account is called a savings account, which is distinguished by the fact that it earns interest. In an Islamic structure, the depositor should understand that all of his money in the savings account will be utilized by the bank to make short term, safe transactions which will typically earn some profits. The bank will share these profits with the depositor, without committing to any specific percentage in advance (as in the interest rate system). In rare cases, it would be possible for the bank to make a loss. This is discussed later. The depositor has the choice of allocating his savings between checking and savings accounts in any proportion that suits his economic conditions.

The Savings and Loan association will make extremely safe loans, of the type associated with conservative banking of the Keynesian era. In fact, these transactions resemble the current transactions made by Islamic banks. These are mostly murabaha loans, which charge a small, agreed upon markup on a short term loan to purchase goods for re-sale. Islamic Banks should attempt to provide services, and also to be specialized. Thus, purchase and re-sale could involve the bank having storage facilities and warehouses. For agricultural produced, the bankers could purchase at the farm, and transport produce to the market place or the mill. Thus the bankers should be involved in the provision of real services, associated with the businesses to which they lend. Another type of Murabaha could involve instalment sales. The bank purchases a good and resells it to the consumer with a knownmarkup over cost of say 10%, and allows the consumer to pay for the product in twelve equal instalments. These type of transactions should not be sham, as they sometimes are currently. The bank should follow Islamic principles in genuinely taking possession of the goods, before delivering it to the consumer. The profits earned from these short term transactions for provision of liquidity should be shared with the depositors according to some mutually agreed upon ratio – for example 50% and 50%.

There are two elements in the proposal which make the savings and loan an Islamic institution. One is the explicit understanding the bank will utilize the money deposited for investments. In this case, the depositor become the Rabb-ul-Mal in a mudarba transaction with the bank. Sharing in actual profits replaces, and eliminates interest. In this situation, the bank is not required to hold any reserves. However, the depositor should be able to withdraw money only upon provision of sufficient notice to the bank, say one month. This is why the Savings and Loan is required to make only short term highly conservative investments, which can easily be liquidated.

There are two ways in which the government will play a role in the Savings and Loan. Firstly, in the fractional reserve system, the Savings and Loan could lend ten times the amount of its deposits via the mechanism of private money creation. Restricting the amount available to the actual deposit will result in a loss of liquidity in the economy which could cause a recession. The solution would be again for the government to create money up to ten times the private deposits in the Savings and Loan, and provide this money as an additional deposit. That is, the government also opens an account at the S&L governed by the same principles as the savings account of the other savers. It will get a share of the profits generated by the short term investments of the bank. An essential and important aspect of this idea is that when government creates money, it would be able to do so in a countercyclical fashion, according to the needs of the economy for growth and employment. As Minsky and many other authors have shown, private creation of credit has the opposite feature, and also removes control of money supply from the government.

The second role that the government can play is to reduce or eliminate the risk to the depositors. In the rare cases, where the bank makes a loss, the government may authorize use of its funds to make up the loss, so that the depositors are insured against losses. While private schemes like this have elements of both gambling and interest, and are likely to be Haram, an Islamic government can act as a guarantor of loans in the last resort. Thus it can provide these services without violating the Sharia, provided that the contracts are designed suitably.

There is an important conceptual difference between the Islamic Savings and Loan and its Western counterpart. The Western versions are purely financial institutions, with minimal or no involvement in real world business operations. Islamic law requires that services should be provided in order to justify earnings. Thus, the Islamic institutions should participate in real world ventures, and provide other services in addition to purely financial services. This will necessitate a differentiated structure of institutions, because some knowledge and skills relevant to different types of real world businesses will be required. We now list a variety of differentiated specialized savings institutions that could come into existence in an Islamic economy. These could be housed within the Savings and Loan, but they could also be separate institutions. It may be possible for the general purpose S&L to invest in these specialized institutions both to diversify its portfolio, and also to keep at arm's length from the real world, which is the current practice. In this way, both goals of separation and of provision of service could be achieved by the general S&L institutions.

6.3 Differentiated and Specialized Savings Institutions

In order to be halaal, earnings must be tied to provision of service. Also, provision of financing is not considered to be a service that can be used to earn money in a risk free fashion – this is the rule against interest. Therefore, Islamic institutions must necessary be more closely linked to real world service provision than existing western institutions. This will require a differentiated structure of institutions, some of which are described below.

6.3.1 House building Finance

One of the major purposes of savings is to finance purchase or construction of a house. Until recently, England used to have building societies owned on a mutual and cooperative basis, organized to provide mortgages to people to enable them to purchase homes. This could provide an initial pattern for an Islamic institution. However, the Islamic analogue would do more than just finance loans. It would have contacts with architects, construction companies, real estate agents etc. Because these building societies would be large and act on behalf of many consumers, they would embed a lot of experience which the typical home buyer does not have. Thus, the Islamic house building society which would be mutually owned by people planning to purchase homes, would be able to provide very valuable real services to its customers. One of the important modes of financing would be Istisna' where the buyer contracts with a construction company through the House Building Society to have a house constructed via instalment payments. House building societies could own stocks of houses and also provide many other types of services related to the rental and purchase of houses. The point is that a specialized institutions which allow customers to save towards purchase, or other kinds of long term housing service contracts, would be of much greater value to society than the current system which provides purely financial services.

6.3.2 Transport Societies

Similarly, a specialized mutual cooperative society for provision of transport services could arrange for purchase of cars. People could have savings accounts which would be the basis of loans to lease or purchase cars from the society. As already discussed, such a society would provide many other services to its members. Like auto clubs, it could provide emergency road services, as well as all types of car repair services. It could run car-pooling services, and also arrange for rentals and bus services. Lease-purchase agreements enabling customers to buy cars on instalments would only be one of the transport related services provided by the service oriented Islamic institution. This would differentiate it from western counterparts which create clear separation between pure financial services and real services.

6.3.3 Hajj Services

The successful Tabang Hajji association provides a template for a specialized savings institution which could easily be replicated over the Islamic world. Muslim customers who wish to save up for Hajj could open accounts here. The specialized nature of the savings would enable to the institution to focus on investments related to provision of Hajj services to its customers. The institution would invest in transport services, rent or own properties near the Holy Places, and make other arrangements to facilitate pilgrims. Thus it would be in a position to efficiently serve its customers with a complete range of services related to Hajj.

6.3.4 Investment Banks

These could be on the pattern of existing investment banks in the west, but would need to ensure compliance with Islamic principles. These banks would engage in risky ventures, and provide much larger profits to their clients than are available elsewhere. At the same time they would share the risk of losses, since the gains from business are tied to the associated risks, according to Islamic law. People with money in excess of their needs could pool (to spread risk) and invest in business ventures, hoping to make a profit in order to carry out some project of value from the Sharia perspective. It is important to note the accumulation of money without purpose is not permissible in Islamic law. Thus all institutions for accumulation of wealth should be accompanied with educational institution providing training in the permissible uses of wealth. This is to avoid Islamic sanctions against those who collect wealth without meaning to spend it for the sake of Allah.

Islamic institutions will operate exclusively on the basis of partnership, sharing in profits of the project financed. This will create ownership, giving the institutions a stake in the venture. Currently, about 70% of new business start-upsin the USA fail, resulting in loss of large amount of savings of enterprising people in private sector. Banks provide loans backed by collateral to these ventures, and therefore do not have an active interest in success or failure of the venture. A partnership arrangement should lead to a substantial

reduction in this failure rate, as the bank will have experience and size to be able to protect the starting entrepreneurs from mistakes. Also, government provision of money could also provide some insurance against failures, so as to nurture entrepreneurship which is the heart of an economy. This should lead to substantial gains in productivity in an Islamic economy.

Another major shortcoming of the current financial system can be rectified by switching from private money creation to government creation of money. As the government will supply banks and other financial institutions with money on an interest free basis, it can also regulate how this money is to be spent. For instance, it could require that 10% of the money provided by the government should be lent as Qarz-e-Hasna, for the needy. It could regulate and audit departments set up by the bank to screen applicants and provide money as an interest free loan to eligible parties. Similarly, there are many cases where the social returns from investment far exceed private returns - for example in educating children. Also there are many cases where private returns to investment are positive while social returns are negative cases of high pollution industries, or of sale of culturally damaging products like pornography. Here the government could require banks to evaluate social returns, and provide incentives to do lending in accordance with social returns. This could not be done by profit motivated private sector banks, but there is no difficulty in the government setting up rules by which money it lends at 0% interest is to be used.

6.4 Awqaf

Awqaf form a central and essential element of the financial institutional structure of an Islamic society; they replace insurance, which is central to capitalist finance. We provide a brief explanation of this aspect. Due to violent religious warfare in Europe, consensus emerged on using a secular basis for political organization; for a detailed exposition, see Zaman (2015). The concept of a society as an organic whole was replaced by the idea of individuals pursuing separate goals within a common social and political framework. Within this framework, collective action becomes the responsibility of the government. In the process of colonization, most Islamic lands came under European rule. Indigenous Islamic political, social and economic structures were weakened or destroyed, and replaced by European institutions. This has led to a tremendous gap in provision of social services in Islamic societies, as governments have failed to provide the required level of services.

Historically in Islamic societies, social services have been community based, and have been provided by Awqaf. Hoexter et al. (2002) show that the waaf was central to Islamic civil society, and provided a vast range of social services. The neighbourhood is a vital component of an Islamic society, and there are many religious commands and requirements, such as regular prayer at the local mosque, designed to build community. The rights of neighbours were emphasized so much by our Prophet S.A.W. that the companions thought that they might even receive a share of the inheritance. Awareness and fulfilment of these rights would automatically create a community within neighbourhoods. These communities provide the means to translate certain Islamic ideals into practice. While it is understood that providing food, education and medical care to all within the society is a collective responsibility, individuals cannot fulfil it. Also, the government is not well placed to fulfil these responsibilities efficiently. In Islamic societies, the communities provide the means to convert these ideals into practice. The usual method is by means of the Waqf, which are often set up by communities, and supported by governments.

Efficient provision of social services requires detailed local information which is available to communities, but not to governments. Many operational models for social service provision have demonstrated the value of publicprivate partnerships, with the result that NGOs are playing an increasingly important role in this area. However, this solution neglects the vital role of communities, and the results being achieved also demonstrate this deficiency. In the Islamic model which functioned efficiently to provide health, education and welfare to all, the Trust or Waqf organized by communities played a vital role. The ownership of the Waqf by the community makes an essential difference. If the government plays an enabling role, and provides some minimal levels of support to communities, this could create the basis for revolutionary improvements over current models. To illustrate the potential, we provide a few examples.

The Grameen Bank succeeds in getting high repayment rates and returns in poor communities where transaction costs in terms of gathering information on creditworthiness and enforcing repayments would be too high for a commercial operation. Inside information and social pressure based on community is crucial to its success (Stieglitz, 1990). The Orangi Pilot Project succeeded in laying down sewer lines in a poor neighbourhood at minimal cost because of community involvement; see Khan (1998) for details. The community knew which members could afford to pay, and could enforce an equitable distribution of the burden. It could also exploit

knowledge of relevant engineering skills available with members of the community. Similarly, Bowles and Gintis (2006) provide many more examples of successful operation of community based initiatives and firms in situations where conventional theories predict failure based on incentive and informational problems. In line with our suggestion that government needs to play an enabling role, they point out that communities are fragile, and government policies can make or break communities.

Moving the power of money creation to the government will provide an opportunity to finance projects with high social rates of return, based on the empowerment of communities. The current private creation of money maximizes investments in projects with high private rates of return. However, economic history provides ample testimony that the private and social returns of projects are often diametrically opposed. Currently projects which destroy the planet, inflict massive social harms, but bring massive returns to a very small segment of society, are strongly favored. Only when the government creates money, will it be possible to shift the financing of projects to those with the highest social returns.

6.5 Alternatives to Insurance

In many ways, insurance is at the heart of modern financial system, and bears major responsibility for the global financial crisis. We will argue that insurance of certain types is a natural government monopoly, and private provision of insurance can be, and has been, extremely harmful to the public interest. Current attempts to Islamize insurance are by means of Takaful, which attempts to replicate private insurance within the framework of the Sharia. The alternative we propose is substantially more radical.

In the first instance, for many kinds of insurance, a cooperative scheme is the preferred Islamic model. A community which understands that provision of care to the sick is a collective social responsibility may hire the services of doctors, and necessary medical infrastructure, to provide this service. The costs would be shared collectively by members of the community, fairly, in accordance with their ability to pay – not according to their risk factors. The spirit of the Islamic insurance contract is cooperative; it is based on social responsibility of taking care of the needs of members of the community. It is not adversarial like typical modern private insurance contracts. The government would be a natural provider of re-insurance, taking care of the larger risks which cannot be handled with local resources. In fact the government always bails out private sector after major crises, but our

institutional structure would formally recognize this role of the government. Government ability to create money would be an important asset in enabling the government to play this role of re-insurer effectively. We now provide a long list of reasons why our proposed Islamic structure for insurance is substantially superior to existing private market models which are being mindlessly imitated.

6.5.1 False Promises and Gambling

From the Sharia point of view, insurance companies (and re-insurance companies) make promises that they cannot fulfil. The insurance companies do not provide any service; they provide a gamble which is negatively correlated with other risky positions of the insured. Thus the insurance contract is a gamble, where the statistical odds are very much on the side of the insurance companies. However, sometimes they do lose, causing great harm. If the number of claims substantially exceeds statistical averages, the insurance companies go bankrupt. The collapse of AIG, the largest insurance company in the world, is a recent spectacular example. In this, and many other instances, government intervened to prevent the collapse, thereby showing its hidden role as the real background insurance agency. Formalizing this role by removing the middleman private insurance company would have many important benefits to society.

6.5.2 Social Benefits

Islamic rules in all spheres, including business, are meant to generate community, cooperation and good-will. The provision of insurance on a cooperative basis, as suggested above, builds on natural human sentiments of sympathy for those who suffer. Psychologists have found that infants are born with these sentiments; they empathize with feelings of others, and take action to help when they can. Modern adversarial insurance contracts create precisely the opposite motivations – they are based on taking advantage of the potential sufferings of the others. The insurance agents wants to exaggerate the probability and intensity to potential losses to induce customers to buy and to pay high premiums. However, when the time comes to pay a claim, the insurance adjusters are trained to minimize the value of damages so that the firms pay as little as possible. The adversarial contract creates moral hazard – customers may cause themselves damage, and make exaggerated claims, to maximize their payoffs. A cooperative contract would substantially reduce

this moral hazard, because it operates on the basis of social norms, rather than market norms.

6.5.3 Avoiding Concentration of Wealth:

It has been well known since Adam Smith that only the wealthy can offer insurance, since the large risks involved require large collection of assets. Furthermore, the importance of insurance – required for all loans for purchase of cars and homes, and in many other instances – ensures that those who are able to offer it, will earn good returns on their money. Using re-insurance contracts, the wealthy can make huge amounts of risk free additional money from their wealth in ways that are simply not possible for the less rich. Thus provision of insurance by private parties creates an enormous concentration of wealth, as is currently being witnessed in capitalist societies. The cooperative scheme suggested above, with the government as a backup re-insurer, eliminates this problem. Cooperation allows pooling of money for sharing of risks. For large risks which cannot be handled by pooling, the government provides additional safety. In either case, we do not involve wealthy by-standers to provide insurance for profit, which creates concentration of wealth.

6.5.4 Too Big to Fail

The great depression brought home the lesson that core financial institutions of a capitalist economy cannot be allowed to fail; their failure would seriously disrupt all functions of the economy. Since then, governments have bailed out large corporations in emergencies. Thus, in effect, the government has always provided backup insurance. However, the current financial structure is such that wealthy financiers make huge profits by gambling, and covering their bets with insurance. On the occasions they fail, the government steps in to cover their losses, which means that the public pays for this loss. In all cases, the money goes from the poor to the wealthy. By creating cooperative insurance contracts, and removing private for-profit insurance, the public will still collectively bear the burden of large catastrophes, but will also gain the benefits previously enjoyed by wealthy insurers.

6.5.5 Natural Government Monopoly

The many financial crises caused by unfettered greed have led to a nearly universal consensus on the need for regulation of financial institutions. This recognition itself runs counter to central free market ideologies because it assume that (1) the free market requires regulation, and (2) the government is capable of regulating. As we have already discussed, this is an unequal battle; the immense financial resources in private sector overwhelm the regulators and the regulation process, leading to regulatory capture⁶. The only solution is for the government to take over the functions of large insurance companies. Furthermore, this is natural, since it is the responsibility of the government to respond to major disasters whether natural or man-made, and to look after public welfare. In the field of insurance, the government can ensure by law that everyone must be insured. This eliminates problems of adverse selection, and also the practice of risk screening by private insurance companies, both of which cause serious difficulties with private insurance schemes. Thus there are many ways in which insurance is a natural government monopoly.

6.6 Banning Speculation

One of the reasons that the financial sector has grown enormously over the past thirty years is the illusion of wealth creation. It has been asserted vigorously that a rise in stock prices or in land prices creates an increase in wealth. In fact, this wealth is an illusion. At the time of the global financial crisis, the value of financial derivatives was about ten time the entire planetary GNP. After the crisis, more than half of the wealth disappeared, even though there was no physical destruction of any sort. Similarly, the amount of foreign exchange traded is many times the total real value of world trade. The vast majority of these transactions are purely speculative gambles. These have increased dramatically after the repeal of the Glass Steagall act, whereby restrictions on gambling by banks were removed. In addition, the growth of derivatives is an essential accompaniment of this phenomena. In effect, derivatives allow the hedging of bets. One can gamble on a stock to increase, but also buy a derivative to protect against a decrease. Thus one can make relatively safe bets, where the gains can be large, while the losses are limited.

The introduction of complex derivatives of different types has turned the financial markets into a huge casino where sharp traders can prey on the unwary innocents. Huge amounts of money are made by technical manoeuvres

⁶As an illustration, Senator Blanche Lincoln from Arkansas, argued that government-run insurance plan undermined free-market competition. In Arkansas, a single insurance provider Blue Cross Blue Shield has 75 percent of the market. Insurance premiums have risen five times as fast as wages, yet the state representative argued against government provision of insurance.

of no social value, which rewards the financial sector at the expense of the real sector. This extreme distortion of real incentives leads to apparent growth in wealth, while productivity and employment are declining. The excess financial wealth generated also finds its way into land and real estate, causing rising prices and rewarding the ownership of assets, instead of production. In order to improve productivity and employment, it is essential to put several kinds of restrictions on the markets to prevent speculation.

Many markets have rules to prevent excessive variations in stock prices. In purely speculative processes, bubbles are common in stock markets, where the prices become completely de-linked from the real world assets they represent. The prices are governed purely by speculative movements. In an Islamic framework, this can be avoided by maintaining strong linkage between the value of the stocks and the value of the ownership of the real assets the stock represents. Firm valuations can be realistically determined in many ways, and the stock price should only be allowed to vary within a small range of this real price. Similarly, real estate prices should also be controlled so as to prevent bubbles. The dangers of pure speculation, as represented by High Frequency Trading, are now being widely recognized. There are many useful proposals which have been made to eliminate gambling, while retaining investment, exactly as Islamic laws suggest.

The main point is the activity which provides service to society should be rewarded, and opportunities for making money by purely speculative activities should be severely restricted. If this is done, the real productivity and real wealth generation will increase substantially, while the illusion of wealth creation will decrease. Using current accounting procedures which treat both types of wealth creation in the same way, it might appear that Islamic law reduces growth. To fix this problem, we must change our accounting methods. Many suggestions on how this can be done have been given in the Stiglitz-Sen-Fitoussi (2009) report, which details shortcomings of current methods of calculating the GNP. An Islamic approach would build on this and go further. Encouraging real productivity would provide incentives which would be far more favourable for wealth creation than the highly distorted incentives produced by current financial institutions.

7. Answering Common Objections

A very large proportion of the money currently in existence is bank-created money, or demand deposits. The Chicago Plan proposes to replace this money

by government created money. As we have discussed earlier, the government will print this money and provide it to banks, to replace the bank-created money. This is essential for a smooth transition from a bank-created money based system to one in which the sole power for creation of money lies with the government. Because free market arguments are currently dominant in the academia, this will strike many as being a bad idea, because governments should have a minimal role in a free market.

Over the past thirty years, the removal of restraints on banking and finance has led to an unprecedented boom in the finance industry. They have used this wealth to finance a huge amount of propaganda in favour of free markets, and against governments. According to standard and dominant views, governments are inevitably corrupt, and government interference with free markets is the single most important obstacle to progress. Thus, provision of the power to print money to the government would necessary lead to harmful outcomes. According to these dominant views, it is essential to keep this power in private hands, and ensure that the Central Bank is independent of government authority and control.

7.1 Fear of Big Government

Numerous books, movies, and other popular media make the argument that "freedom" is the most sacred value, prized above all other things. Economic freedom is one element of this freedom. This requires that the free market should be allowed to operate without any regulations. To the extent that governments interfere with freedom, they are bad. This argument has become part of mainstream economic teachings over the past thirty years. Thus it is taught to economists and policy makers the world over. These teachings are encapsulated in the "Invisible Hand" theory, according to which, if all agents act freely in their own self-interest, the best social outcomes result. The false paternity, and myriad failings of this theory which is currently taught in economics textbooks are documented in Zaman (2013).

Following the free market failure graphically demonstrated by the Great Depression of 1929, the necessity of government interventions, had become obvious to all in the Keynesian era, Many authors have documented how the campaign to eliminate Keynesian ideas, and promote the free market ideology, was successfully carried out in the last quarter of the twentieth century. Large numbers of institutes, think tanks, organizations, scholarships,
conferences etc. have been funded and organized to promote free market views. A brief but revealing documentation of the propaganda campaign for free markets is provided by Alkire and Ritchie (2007). An insightful and revealing book length treatment is provided by Naomi Klein (2011) in *The Shock Doctrine: The Rise of Disaster Capitalism*.

7.2 Fear of Government Corruption

The idea that governments are always more corrupt than the private sector is contrary to the historical facts. Over a hundred major documented financial crises of the past century have been due to corruption in the private sector. The private sector financial scandals running into trillions of dollars in the USA have far outweighed any public sector scandals. In fact, the vast majority of the public sector scandals have also resulted from the purchase of government officials and policies by wealthy private sector institutions and individuals. Recent Supreme Court rulings in the USA have removed limits on private contribution to political campaigns. Commenting on this change, Democracy 21 president Fred Wertheimer remarked that "The Supreme Court majority continued on its march to destroy the nation's campaign finance laws, which were enacted to prevent corruption and protect the integrity of our democracy. The court re-created the system of legalized bribery today that existed during the Watergate days."

The three major banking crises discussed in Section 5.1 all arose from corruption in the private sector. The cumulative effects of these crises were sufficient to wipe out all gains made in the financial sector since the beginning of the twentieth century. Revolving door appointments from commissions which regulate businesses to board members of giant multinationals, testify to the power of the private sector to influence congress. All this power derives from the ability to create money. At this point, glaring failures of the private financial sector have led to nearly universal consensus on the need for regulation. If the government can be trusted to regulate, it can also be trusted to handle the creation of money.

This is not to suggest that we should be blasé about the possibility of government corruption – definitely there is a huge amount of evidence of government corruption everywhere; both in the east and in the west. However, the idea that the government is special in this regards, and there is no corruption in the private sphere is a myth – people can be honest and corrupt, and with same people in both spheres, we can expect equal levels of corruption in both places. Just as we require regulation to try and control corruption in the private sphere, so suitable schemes can be devised to control corruption in the government sphere. There exist many successful models of strategies that could be employed for this purpose, if the will is present.

7.3 Fear of Reduced Growth

Due to ideological propaganda, it is widely believed that free markets provide the engine of growth, while government control stifles productivity and innovation. In fact, history teaches a radically different lesson. Throughout history, as well as currently, the effect of free market policies has been to allow for the concentration of wealth into a few hands. Just last year, fifty new billionaires were created in the USA, while the bottom quintile saw a decline in real income⁷. The same has been true the world over as introduction of free market policies in Chile and Russia, and many other parts of the world led to the creation of billionaires, and the coming of hunger, poverty and starvation to countries where all had been fed in socialist regimes. While there is not a single instance of free markets leading to development and progress, all cases of rapid economic growth have required strong and stable governments, which have guided the growth process through many kinds of active interventions. This has been just as true in USA, Germany and Japan, as well as in East Asia. Thus the idea that giving governments the power to print money is a recipe for disaster is just a myth spread by those who benefit directly from having current control of this power. In "Peddling Prosperity", Krugman has documented that while the free market policies of Reagan and Thatcher had little or no effect on growth, there was a massive increase in inequality, and in the share of income going to the wealthy.

7.4 Fear of Inflation

The idea that if governments are authorized to print money, they would print huge amounts for themselves and thereby cause inflation does not match the

⁷http://www.dawn.com/news/1134923: THE wealth of the world's billionaires now stands at \$7.3 trillion, an increase of 12pc from last year, according to a new report released September 18 by Wealth-X and UBS. There are a record 2,325 billionaires in the world, up from 2,170 in 2013 and 1,360 in 2009, the first year following the financial collapse. The stock market and finance capital are the driving forces behind the wealth of the world's billionaires. The top industry for billionaires, according to Wealth-X, is 'finance, banking and investment,' which accounts for close to 20pc of the total billionaire population, followed by industrial conglomerates at 12pct and real estate at 7pc.

historical evidence. Ellen Brown (2011) analyses many hyper-inflations that have occurred in the past century. She shows that while economists argue that these have been due to over-printing of money by the government, in fact the causes have always been related to the private creation of money by banks outside the control of the government. Many cases can be documented in the recent past where huge amounts of money have been printed by central governments without leading to inflation. For example, trillions of dollars have been printed under quantitative easing programs in the USA without leading to a corresponding increase inflation; see figure in section 9.4.1. Thus the link between government creation of money and inflation is not as strong as claimed by those who wish to keep money creation in the hands of the wealthy elites who own banks. See also Zarlenga and Poteat (2016) as well as comments on this article, for an extensive discussion.

Historically, there are many countries where central banks have been under government control, but there is no evidence of any disaster associated with such control. Since governments are held responsible for economic conditions, they have a strong incentive to manage the economy well. Nonetheless, to curb abuse, government control should be subject to strict regulation, just like the private financial sector. Money creation by central bank should be supervised by politically neutral authorities as well as independent experts. Interestingly, there is a natural check on seigniorage and inflation tax – its burden falls disproportionately on the wealthy. This is entirely the opposite of private creation of money which is a burden on the poor. Given that the rich and powerful classes will oppose excessive creation of money, the government is unlikely to go against their wishes.

8. Advantages of the Islamic Plan

We have presented above the bare bone outlines of the structure of a collection of Islamic Institutions as an alternative to the current structure of modern financial institutions. At the root of the changes proposed is the government creation of money. The power to create money must be removed from the private sector and given back to the government where it belongs. However this one change is not sufficient to transform financial institutions to comply with Islamic ideals. A collection of related changes are required on several different fronts. A detailed presentation of all the changes required would be too lengthy to present in a brief article like this one. However, the changes have an organic nature. Once the spirit of the change is clear, required extensions, and removal of obstacles would occur naturally as part of the process of transition and growth. Only some key elements of the required changes have been sketched above. While justifications for these required changes out have been discussed, we recapitulate some of the main issues, and also provide some additional reasons in this section. Perhaps one of the most important arguments in favour of our Islamic Plan is the elimination of inherent injustice in the private creation of money.

8.1 Justice

It is extraordinarily unfair and unjust to allow a small segment of the already wealthy to have the ability to create money. This privilege allows them to amplify their wealth at the expense of others. According to Sharia rulings, money creation is a privilege of the government. To capture this privilege for themselves, a tiny minority of the powerful elite have strongly pushed for central bank independence all over the world. For further details, see "The Battle for the Control of Money," by Zaman (2016). Current economic theory argues that the power to create money lies with the central bank, and that this should power should not be given to the government, as it will give favours to cronies and buy votes. Against this hypothetical abuse of power, we have the following arguments to justify taking the power away from private sector banks and giving it back to the government.

The potential abuse of power by the government should be weighed against the actual abuse that has occurred via private sector creation of money. This is documented in the vast numbers of statistics which attest to increasing income inequality, mainly due to money-making strategies available only to the wealthy through the process of money creation. Furthermore, the power to create money was taken away from governments, and given to privately owned central banks using a number of stealthy stratagems, which involved concealing several facts. Details of the stratagems used to create private control over central banks all over the world are provided in several reports. For example, Henderson (2011) describes four major central banks which control the large oil companies and are among top ten stockholders in nearly every Fortune 500 company. Requests for information about top stockholders and ownership structure of these banks were denied for "national security" reasons, but there are many clues which point to eight families which control the major private banks. In nearly all of the economically advanced economies, the central banks are privately owned, but the appearance of government ownership is carefully maintained. Similarly, the economics textbooks all over the world teach that the power of money creation lies with

the government, when the facts are exactly the opposite, as clearly stated by McLeay (2104) in the quarterly bulletin of the Bank of England. All this secrecy and mis-direction is used to preserve and protect a grossly unjust and unfair system from public scrutiny.

8.2 Socially Optimal Investments

A fact which is mentioned, but not highlighted, in economics textbooks, is that the social returns to investment are frequently very different from private returns. One of the most important examples is that of the education of children of the poor. Not much money can be made from this, since the poor cannot finance education, and children often drop out to support families by working. However, social returns to educating children are enormous. As a recent World Bank report (2006) shows, a dominant component of the Wealth of Nations today lies in the "human capital" embodied in the people.

The current system is geared towards making investments with high private returns, not high social returns. Stripping the nation of natural resources, and causing environmental degradation, is in effect stealing from the entire society, as well as future generations, for the sake of private profits. This is a natural outcome of leaving money creation in private hands. If the government controls money creation, it can also have much more control over the investments to be made with this money. It can reward and encourage projects with high social returns, and discourage and penalize projects with low or negative social returns. In order to accomplish this, it would be essential to replace the GNP measure with a more accurate gauge of national wealth. This is because currently policy makers are fixated on this measure, which ignores essential elements of vital importance in the development process.

Current utilization of misleading measures of progress, as well the as the dominance of the financial sector, has led to massive investments in non-productive areas, such as real estate and stocks. For example, currently in the US economy, stock markets are soaring, while the unemployment rate, productivity, and all measures of the real economy are getting worse. Again, the root cause of this is the current financial system, which rewards all money making schemes equally, regardless of whether or not they are socially beneficial. This damaging dynamic can be changed only if the government re-captures control of the process of creation of money. Simulations done by Benes and Kumhoff (2012) show large productivity gains from implementation of the Chicago Plan, simply because government funds can be used to finance more productive investment projects, rather than those projects which have the largest collateral backing.

8.3 Community Based Development

Designing suitable development projects requires local knowledge which is simply not available to the government. Efforts have been made to shift the burden to NGO's, and to create public-private partnerships, but effective development is only possible with the involvement of the community. This is in fact the original Islamic model, which has been used throughout Islamic history. Today the effectiveness of CBD, and its offshoot, Community Driven Development, is being more widely recognized. According to the World Bank: "Community-driven development (CDD) programs operate on the principles of local empowerment, participatory governance, demand-responsiveness, administrative autonomy, greater downward accountability, and enhanced local capacity. Experience has shown that when given clear explanations of the process, access to information and appropriate capacity and financial support, poor men and women can effectively organize to identify community priorities and address local problems by working in partnership with local governments and other supportive institutions."

Currently governments are severely budget constrained and have limited developmental budgets. Shifting the power of money creation from private sector to the government will enable the government to finance community based initiatives, which is the key to development. Government by themselves lack the capacity and the local knowledge to accomplish this, which is one reason why so many government based initiatives fail. They are based on outsiders deciding what is best for the community without sufficient local knowledge. By channelling money to socially useful projects, large gains to society will be created. These results cannot be achieved by private investors working for private profits.

The proposal to rely on community driven development is in harmony with the Islamic stress on the rights of neighbours. Five times daily meetings in local mosques were meant to foster a sense of community. Framing the problem of development in terms of creating community, instead of as a service to be delivered by the government to the public, creates many positive externalities. Empowering communities by providing governmental support for community based initiatives will create thousands of agents of change. In addition to rapid development, this would also lead to creation of cooperation, trust, and other forms of social capital. Historical studies of Islamic societies show the vital role played by rich and vibrant communities in providing social services.

8.4 Technical Advantages

Benes and Kumhoff (2012) use simulations to show the following important gains from switching to the Chicago Plan, which replaces fractional reserve banking by 100% reserve banking.

8.4.1 Direct Control of Money Supply by Central Bank

Keynesian economic theory shows that it is important to have the optimal quantity of money in the economy. Too little can lead to recessions, while too much can cause inflation. When the bank creates money, it has immediate and direct control of the money supply. In the current system, the bank creates high powered money M0, which can, at the discretion of the banks, be translated into the money supply M1. The economics textbooks describe this is a mechanical process in which a simple multiplier is applied by the banking system to create M1 from M0. This creates the illusion that banks do not exercise discretion in the process, and that Central Banks in effect control the money supply. This is not true, as vividly demonstrated by Mian and Sufi (Chapter 11, 2014). In an effort to fight the recession following the global financial crisis, the Federal Reserve Bank has adopted a policy of "quantitative easing" – QE – substantially increasing the monetary base. As Diagram 11.1 of Mian and Sufi shows, there has been a massive increase in reserves within the banking system, but there has been virtually no effect of QE on the total money supply. This diagram also shows that the conventional textbook descriptions of money creation are wrong, as the central bank policies are completely ineffective in increasing the money supply. The banks simply absorb excess cash as reserves, without lending them out – borrowers are scarce in recessions, because there are few profitable investment opportunities. This problem would not arise under a 100% reserve system, where the Central Bank directly creates the money supply.

8.4.2 Massive Reductions in Private and Public Debt

Under the current system, banks create money by making loans. Thus the private production of money by banks is directly tied to debt in a one-to-one fashion. The amount of money created by banks is exactly equal to the amount

of debt created by banks. Additional debt is created when governments borrow from domestic sources, including the central bank. These governmental debt liabilities are huge, and debt service payments eat up a large portion of total revenue, leaving governments with very narrow fiscal margins. Typically budgets are balanced by cutting development projects, which are not only the lifeline of the majority of the population, but also the sole route to development. Private debt also exerts a drag on the economy, as documented by Mian and Sufi (2014). Thus the creation of money, which also creates debt, is not a good way to create an economic stimulus. However, under current fractional reserve system, it is the only way available.

Switching to government creation of money would eliminate or substantially reduce government debt, and interest payments on that debt. This would create fiscal margin for development projects. As long as these are directed to projects of high social returns, the growth of the economy would accelerate. The 100% reserve system would also reduce private debt substantially, especially if Islamic schemes of Qarze Hasna, financing for Community Based Development Projects and also Musharka financing were followed. This reduction of private debt would also substantially improve economic performance, as documented by Mian and Sufi (2104).

8.4.3 Elimination of Financial Fragility

A great advantage of the 100% reserve system is the complete elimination of banking crises. There is no question of bank runs, since the system requires banks to maintain full coverage for all deposits. This is also in line with the requirements of the Sharia, as discussed earlier. In addition, the problem of financial fragility highlighted by Minsky (1992) would also be resolved. The current system of private money creation acts to exacerbate the problem of business cycles. In an expansion, banks create more money, creating inflationary pressures, and de-stabilizing the system. In a recession, banks reduce lending, reducing money supplies and causing prolongations of the recession. All of these problems would be avoided by giving the power of money creation back to the government. With the complete control of money supply, the government could follow Keynesian counter-cyclical policy to reduce inflationary pressures and prevent recessions.

8.4.4. Reductions in Frictional Costs

As shown by Benes and Kumhoff (2012), the Chicago Plan will lead to lower real interest rates and also lower inflation rates. High interest rates discourage

investments and reduce growth, while high inflation rates inflict several types of adjustment costs on the economy. With access to the power to print money, taxes could be reduced or eliminated. In addition to incentive costs, this would also reduce inefficiencies due to corruption, and help improve governance. The printing of money automatically creates a just taxation scheme, since the inflation tax is proportional to existing wealth. With a lower debt burden, there would be a reduction in monitoring costs associated with repayment of loans.

The central bank will have more instruments for the control of money supply then it currently does. The interest rate and the quantity of money can be separately targeted, for example. Given that the banks will receive large amounts of money created by the Central Bank, the terms can be set by the central bank. Zero interest is not a lower bound, so that the liquidity trap can be avoided. The Central Bank can set negative interest rates if it so desires. The increased capability of the Central Bank to control the money supply leads to possibility of complete price stability with zero inflation, as shown by Benes and Kumhoff (2012).

9. Conclusions

The nature of the subject is such that this paper is lengthy and complex. To conclude, we attempt to summarize and highlight the central issues discussed at length in the paper.

First, we note that the system of fractional reserve banking allows the private banking system to create money out of thin air. The current system is such that the vast majority of money is created by the private sector, while only a little -10% or less - is created by the government. Furthermore, this money creation is intimately tied to debt –money is created when banks make loans at interest. This private creation of money is extremely harmful to society in many ways, as discussed below.

Debt based creation of money leads to prevalence of interest and inflation, both of which are socially harmful. Mian and Sufi (2014) have explained that accumulation of debt leads to a crisis prone system. Private money creation is done to excess at times when restraint is needed, and shrinks at times when money is needed by the economy. The interest based debt contract leads to great injustice, which can be removed by shifting to equity based contracts favoured by Islamic law. Because debts guarantee returns to the wealthy lenders but not to the poor borrowers, concentration of wealth and inequality results from this system. A historical analysis is carried out to show that these are not theoretical concerns. Rather, banks have suffered from massive crises multiple times, leading to misery for the millions, but gains for a minority elite class. Replacement of western banks by Islamic banks currently in vogue would do nothing to address these problems, as the money creation would remain in private hands.

As a certain amount of money is vital to the functioning of an economy, we cannot simply ban private creation of money. That would lead to substantial reduction of money supply and hence a recession or a depression. The Chicago plan aims to remedy this problem by having the government print all of the money that is currently being created privately by banks. Moving to a 100% reserve banking system would restrict the power of money creation solely to the government. This has the potential to eliminate all of the problems which arise due to private creation of money, as discussed in the previous paragraph. Opponents of the Chicago Plan have raised several objections which are discussed and answered in the paper.

Moving to government creation of money allows for radical reforms in the structure of financial institutions of a society. The most important change is that in a system of privately created money, money is created for projects which maximize personal profits, regardless of how much social and environmental damage is caused by these projects. However, with government in control, money would be readily available for projects which maximize social returns. The paper goes on to suggest that Islamic financial institutions would be involved in providing real services, as opposed to purely financial ones. This would lead to a differentiated and diverse structure of institutions adapted to Islamic societies. We provide an outline of what such structures might look like, and how they would be superior to current institutions which concentrate wealth and are crisis prone.

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Willingness to Pay by the Farmers for Safer Use of Pesticides

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Abstract

This study attempted to investigate the determinants of indirect health cost of pesticide use by farmers. For the purpose willingness to pay for safer pesticides is taken as indirect health cost of pesticide use. The ordered probit model has been employed on primary data collected from Tehsil Bahawalpur in Pakistan. The results revealed that health impairment index, farmer's literacy status, number of dosage of pesticides, farmer's age, use of safety measures, farmer's perception about symptom and working hours have positive impact while number of doses of insecticides, farm size and use of pesticide according to recommended dose have a negative impact on willingness to pay for safer pesticides. Highest ratio of the farmers (38 percent) is willing to pay over and above 20% premium for safer use of pesticides to avoid health cost of pesticides. It means that farmers are bearing a high health cost by use of pesticides.

Keywords: Health cost; Farmers' health; Willingness to pay; Pesticide use; Cotton growers; Insecticides use

GEL Classification: N5

1. Introduction

Synthetic pesticides have played a significant role in restricting massive damage to crops. The safety of crops would not have been possible

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without pesticides (Damalas & Eleftherohorinos, 2011). On the other hand, environmental damages and health impairments are also caused by the massive use of pesticides (Maroni et al., 2006). In the last forty years, there is enormous increase in the use of pesticides in Pakistan. Furthermore, the farmers particularly the cotton-growers use pesticides indiscriminately (Khan, 2003). It is also documented that the use of pesticides in Pakistan has caused many fold increment in pest population by the development of pest's resistance against pesticides. This massive and indiscriminate use of pesticides results in enormous health cost to the farmers.

The economic valuation of health costs by use of pesticides is complex due to the market and non-market health-cost. Market components of health cost include illness cost, loss in yield productivity and loss of working days, etc. and non-market components include cost of illness, etc. It is not easy in a model to combine both market and non-market components of pesticide related health cost, therefore, majority of the studies focused on market components of pesticide related health cost. Ajavi (2000) analyzed the cost of treatment and cost of working days lost for Cote d Ivoire. Rola et al., (1993) used simply the production losses for Philippines. For Nicaragua Garming et al. (2006) assessed the cost of chronic sickness. Although some studies have attempted to estimate the health cost by including market and non-market components (Khan & Damalas, 2015). However, a comprehensive analysis is needed by combined market and non-market health cost of pesticides use and ultimately agricultural policy formation. For the assessment of non-market cost contingent valuation approach is prevalent in the literature (Khan & Damalas, 2015). In this approach, respondents are offered a hypothetical market, in which they are invited to show their willingness to pay for existing or potential environmental conditions not reflected in any real market. The monetary values obtained in this way are thought to be contingent upon the nature of the constructed market, and the commodity described in the survey scenario. The answers offered a direct way to trace the demand curve for an environmental good that could not otherwise be seen from the market data (Garming, 2006).

Individuals' preferences provide the appropriate foundations to make decisions about changes in well-being or loss of health effects. Using individual preferences, willingness to pay is a suitable measure for estimating the pesticide health effects. According to Carson (2000), the cost benefits analysis or to find out farmers' willingness to pay economically for a proposed change in a commodity, contingent valuation approach is most appropriate technique. To keep the individual constant at its initial level of utility the changes in utility are measured in monetary terms. The similar law is used in case of non-market commodities and services "that is the highest quantity of income that a consumer/individual is willing to forgo to gain or loss the access to the relevant commodity or service" (Lipton, 1995).

The analysis of current study is based on contingent valuation approach to measure the health cost of pesticide use by farmers. By estimating the willingness to pay the policy may be framed to eliminate the health effect of pesticides through financing from the farmers. The core objective of the study is to assess the determinants of farmers' willingness to pay to remain safe from the use of pesticides.

The rest of the article is structured as follows. Section 2 presents methodology and empirical model. Section 3 presents empirical results. Section 4 concludes the study.

2. Methodology

In health economics one of the most commonly used approach for the assessment of non-market commodities and services are contingent valuation approach. Individuals' health is primarily private commodity that is estimated by household theory. To measure the change in the supply of non-market commodity in contingent valuation approach the individual's constant utility is taken a base by applying the compensated demand function of Hicks. For the assessment of pesticide associated health outcomes suitable measure is compensating variation which show the utility level without change. The utility of a farmer (U_0) can be expressed as the sum of health (H_0) and sum of income (I_0).

$$Uo=Io+Ho$$
 (1)

Where $U_0 =$ initial utility level of farmer, $I_0 =$ initial income of the farmer and $H_0 =$ initial health status of the farmer. Suppose health supply increase to H_1 by taking income constant at I_0 i.e. by using a new or developed pest control technique ($I_0=I_1$). Farmer goes up to the higher level of utility U_1 .

$$U1 = Io = I1 = H1 \tag{2}$$

Improvement in health is represented by given up amount of income by the farmer that he is willing to pay to remain at its initial utility level with improved health status. IIIE Journal of Economics and Finance, 2020, 1(1)

$$Uo = Io - F(WTP) + H1 \tag{3}$$

The willingness to pay is a function of attributes, characteristics of the consumer (farmer) and other factors consider affecting the choice. In this study we analyze the factors affecting farmer's willingness to pay for safer pesticides. They are household socioeconomic characteristics, health related variables, pesticides and risk related variables, farm characteristics and farmer's perception.

The functional form of the model is as follows:

WTP = f (HIINDEX, INCOME, LIT, EDU, AGE, FSIZE, DOSEP, DOSEI, PERCEPT, DOSER, SAFETY, WHOUR)......(4)

| Variables | Definitions | | | | |
|--------------------------------------|--|--|--|--|--|
| Dependent Variable | Dependent Variable | | | | |
| Willingness to pay (WTP) | Willingness to pay is a categorical variable, 1= not willing to pay, 2=willing to pay up to 5%, 3=willing to pay 6 to 10%, 4=willing to pay 11 to 20%, 5=willing to pay more than20% premium for safer pesticides. | | | | |
| Independent variables | | | | | |
| Health impairment index (HIINDEX) | Health impairment index ranged zero to fourteen is a continuous variable. ⁴ | | | | |
| Farmer'sincome (INCOME) | Farmer's income is a continuous variable, taken as a farmer's six months income earned in rupees. | | | | |
| Farmer's literacy status (LIT) | Literacy status is a dummy variable, 1=literate, 0=illiterate. | | | | |
| Farmer's education (EDU) | The number of completed years of education as a continuous variable ⁴ . | | | | |

Table 1: Operational definitions of variablesfor willingness to pay model

| Farmer's age (AGE) | Age is a continuous variable, taken as number of completed years. |
|---|--|
| Farm size (FSIZE) | Farm size is a continuous variable, taken as number of acres of land. |
| Number of doses of pesticides used (DOSEP) | Number of doses of pesticides used per acre as a continuous variable (It includes herbicides, fungicides and others excluding insecticides) |
| Number of doses of insecticides used (DOSEI) | Number of doses of insecticides used per acre as a continuous variable |
| Farmer's perception about symptom (PERCEPT) | Farmer's perception about the symptom as ordered variable: 0=not sure, 1=sure, 2=very sure, 3=completely sure. |
| Use of pesticides according to the recommended dose (DOSER) | Use of pesticide according to recommended dose is a dummy variable: 1=yes, 0=no |
| Use of safety measures during pesticides use (SAFETY) | Use of safety measure is a dummy variable: 1=yes, 0=no |
| Working hours spentby a farmer on pesticide use (WHOUR) | Number of daily hours a person works on a farm and remained exposed to pesticides ascontinuous variable. |

2.1 Empirical Model

Willingness to pay (WTP) is a multiple response variable that has inherent order or rank so the ordered probit model is appropriate which can be expressed as:

where WTP* is the latent or unobserved willingness to pay, X is a vector of variables considered to effect willingness to pay, β is a vector of parameters showing the association between willingness to pay and variables in X and is an independently and identically distributed error term with

⁴We have calculated health impairment index through additive method by taking fourteen symptoms of diseases (eye irritation, fever, headache, convulsion, dizziness, shortness of breath, vomiting, skin irritation, nervous diseases, blood pressure, tiredness, urinary diseases, digestive diseases, and other diseases) caused by the use of pesticides. All these health impairments are taken as 1=yes, 0=no. The high value of index shows high health impairment and the low value shows low health impairment

mean zero and variance one. The probability of WTP being in one of J finite categories can be shown as:

where Φ (.) is a cumulative density function (CDF), which estimates the probability of WTP. The ordered probit model allows for calculation of predicted probabilities for each WTP category and marginal effects. When calculated at the means of the data, predicted probabilities indicate the chance of the average farmer being willing to pay a premium falling in each of the categorical premium levels. For the analysis of WTP we have used the following function:

 $WTP* = \beta_0 + \beta_1 HIINDEX + \beta_2 INCOME + \beta_4 EDU + \beta_5 AGE + \beta_6$ FIZE + \beta_7 DOSEP + \beta_8 DOSEI + \beta_9 PERCEPT + \beta_{10} DOSER + \beta_{11} SAFETY + \beta_{12} WHOUR + \varepsilon (6)

In the equation (6) WTP* is the latent or unobserved willingness to pay. WTP is the estimated score of ordered probit model and is linear function of all independent variables.

2.2 Sampling and data collection

Data have been collected through a well-designed and comprehensive questionnaire in 2014, by face to face interviews from farmers in Tehsil Bahawalpur. The cotton belt of Pakistan that is the area which produces major part of the cotton production in the country passes through Tehsil Bahawalpur. So the area may be a good case study. Similarly major part of the pesticides used in agriculture absorbs cotton production. It signifies the geographic area of research for the topic. The non-probability sampling technique is used and a sample size of 203 observations was collected from farmers who were directly exposed to pesticides. Only those farmers were included in the sample who were owners of the farm and also work on farm. The survey was conducted during the period when pesticides were applied on cotton.

3. Result and Discussion

The percentage of willingness to pay in different categories has been shown in table 2.

Willingness to Pay by the Farmers for Safer Use of Pesticides

| Willingness to pay for safer pesticide category | % |
|---|-------|
| Not willing to pay | 25.12 |
| Willing to pay 1-5% premium | 15.76 |
| Willing to pay 6-10% premium | 7.88 |
| Willing to pay 11-20% premium | 12.81 |
| Willing to pay over and above 20% premium | 38.42 |
| Total | 100 |

Table 2: Distribution of Willingness to Pay Responses (%)

The results show that highest percentage of the farmers (38.42 percent) is willing to pay more than 20% premium. It indicates that farmers perceive a high cost of health due to pesticide use. The results of ordered probit model are given in Table 3 and the marginal effects and predicted probabilities for willingness to pay in different categories are shown in table 4. The upper panel of table 4 shows the predicted probabilities and the lower panel shows the marginal effects. The predicted probabilities show the average likelihood of farmer's willingness to pay for safer pesticide use.

| Variables | Estimated coefficients | P> z |
|-----------|------------------------|----------|
| HIINDEX | .135624 | 0.014** |
| INCOME | 7.09e-08 | 0.834 |
| LIT | .9591117 | 0.000* |
| EDU | 0617347 | 0.157 |
| AGE | .0202769 | 0.008* |
| FSIZE | 0499286 | 0.055** |
| DOSEP | .4008564 | 0.000* |
| DOSEI | 3937413 | 0.000* |
| PERCEPT | .5350727 | 0.000* |
| DOSER | -1.530242 | 0.090*** |

Table 3: Estimated Coefficients of Ordered Probit Model forWillingness to Pay

| SAFETY | .4082784 | 0.030** |
|--------------------------------|-------------------------|-----------------|
| WHOUR | .0529096 | 0.083*** |
| Number of obs =203 | LR $chi^2(12) = 189.62$ | $Prob> chi^2 =$ |
| Pseudo R ² = 0.3179 | Log likelihood = | 0.0000* |
| | -203.44794 | |

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*, ** and *** indicates 1, 5 and 10 percent level of significance, respectively.

Table 4: Predicted Probabilities and Marginal Effectsfor Willingness to Pay

| Predicted probabilities | | | | | |
|-------------------------|---------------------|------------|------------|------------|-------------------|
| | WTP | WTP | WTP | WTP | WTP |
| | (No willingness) | (up to 5%) | (6-10%) | (11-20%) | (more than 20 %) |
| | | | | | |
| Constant | .083537 | .2255663 | .17786743 | .24203355 | .27099571 |
| | | Margina | l Effects | | |
| HIINDEX | 0208311 | 0269557 | 0062905 | .0091513 | .044926 |
| IIIINDLA | (0.021)** | (0.021)** | (0.118) | (0.071)*** | (0.015)** |
| INCOME | -1.09e-08 | -1.41e-08 | -3.29e-094 | .78e-09 | 2.35e-08 |
| INCOME | (0.834) | (0.834) | (0.836) | (0.834) | (0.834) |
| LIT | 1516822 | 1763947 | 0401707 | .0576469 | .3106007 |
| | (0.000)* | (0.000)* | (0.000)* | (0.018)** | (0.000)* |
| EDU | .0090919 | .0124791 | .0030397 | 0042543 | 0203564 |
| | (0.168) | (0.167) | (0.241) | (0.214) | (0.159) |
| AGE | 0031144 | 0040301 | 0009405 | .0013682 | .0067168 |
| | (0.014)** | (0.015)** | (0.108)*** | (0.055)** | (0.010)** |
| FSIZE | .0076687 | .0099235 | .0023158 | 0033689 | 016539 |
| | (0.066)** | (0.065)*** | (0.171) | (0.117) | (0.058)** |

| DOGED | 0615693 | 0796716 | 0185924 | .0270479 | .1327854 |
|---------|------------|------------|------------|------------|------------|
| DOSEP | (0.001)* | (0.002)* | (0.075)*** | (0.030)** | (0.000)* |
| DOCEI | .0604764 | .0782574 | .0182624 | 0265678 | 1304285 |
| DOSEI | (0.001)* | (0.002)* | (0.079)*** | (0.034)** | (0.000)* |
| DEDCEDT | 0821841 | 1063475 | 0248176 | .0361042 | .1772451 |
| PERCEPT | (0.000)* | (0.000)* | (0.046)** | (0.025)** | (0.000)* |
| DOGED | .0839921 | .2084152 | .1397446 | .1191864 | 5513383 |
| DUSER | (0.000)* | (0.000)* | (0.044)** | (0.363) | (0.021)** |
| SAFETY | 0645787 | 0797163 | 0174409 | .0284768 | .1332592 |
| | (0.042)** | (0.038)** | (0.125) | (0.104)*** | (0.026)** |
| WHOUR | 0081266 | 010516 | 002454 | .0035701 | .0175265 |
| | (0.098)*** | (0.097)*** | (0.172) | (0.152) | (0.085)*** |

Willingness to Pay by the Farmers for Safer Use of Pesticides

*, ** and *** indicates 1, 5 and 10 percent level of significance, respectively.

Health Impairment index

Theoretically it is assumed that health effects of pesticide use results into increased willingness to pay for avoiding these effects. The ordered probit results have shown positive impact of health impairment index on willingness to pay. The results of the marginal effects show that health impairments negatively influence first three categories of willingness to pay (1= not willing to pay, 2= willing to pay 1-5 percent, 3= willing to pay 6-10 percent premium) and positively influence the fourth and fifth category (4= willing to pay 11-20 percent, 5= willing to pay more than 20 percent). An incremental increase in health impairment leads to pay higher premium for safer use of pesticide. The results are analogous to theoretical expectations and are supported by a number of studies (Ajayi, 2000 for Cote d'Ivoire; Khan, 2009 for Pakistan; Garming and Waibel, 2009 for Nicaragua).

Education of the farmers

Education of the farmer was captured in the analysis by two variables, i.e. literacy status of the farmer as binary variable and the years of education of the farmer as continuous variable. The results of regression analysis have shown that literacy status of the farmer has positive impact on the likelihood of willingness to pay. According to marginal effects education has negative

marginal effect for first three categories of willingness to pay and positive effects for fourth and fifth category of willingness to pay. It explained that literate farmers have more knowledge and information about pesticides risk and symptom. They are more conscious about their health as compared to illiterate farmers and are more likely to pay higher premium for safer pesticide use. The results are supported by Khan (2009, for Pakistan) and Muhammad et al.(2015, for UAE). The years of schooling has no significant impact on willingness to pay in regression analysis as well as marginal effects. The explanation may be that there is lesser variation in years of education of the farmers as majority of the farmers in the economy are comparatively having lesser years of completed education.

Farmer's age

Farmer's age has shown positive impact on willingness to pay in the regression. According to marginal effects age has negative marginal effect for first three categories of willingness to pay and positive marginal effect for fourth and fifth category of willingness to pay. Farmer's age was taken as proxy for farmer's experience and awareness. Experienced farmers have long history of pesticide use and exposure to hazards of pesticide use. They are more willing to pay for safer pesticide use(Khan, 2009 for Pakistan; Garming and Waibel, 2009 for Nicragua; Ajayi, 2000 Cote d'Ivoire; Cranfield and Magnusson, 2003 For Canada; Muhammad et al., 2015 for UAE).

Farm Size

Contrary to theoretical expectations the regression analysis has shown that farm size has negative impact on willingness to pay. According to marginal effects the farm size has positive effect for first three categories of willingness to pay and negative effects for last two categories of willingness to pay. Such type of relationship may be explained as large land holders use appropriate quantity of pesticides with adequate safety measures (Khan, 2003). They experience less negative effects of pesticide use that is why they are less likely to have willingness to pay the premium. The results are supported by Garming and Waibel (2009) for Nicaragua however Khan (2009), for Pakistan has concluded that large family size holders are more likely to pay the premium.

Number of doses of pesticide

The variable of number of pesticides used includes herbicides and fungicides, etc. According to the theoretical expectations number of doses of pesticides usedshould increases the willingness to pay. The regression results have shown positive impact of number of doses of pesticides used on willingness to pay. According to marginal effects number of doses of pesticides used has negative effect for first three categories and positive effects for last two categories of willingness to pay. As the number of doses of pesticides used increases the pesticides exposure and risk increases which leads to more likely for the farmers for willing to pay higher premium for safer pesticides use. The results are supported by Ajayi (2000, for Cote d'Ivoire) and Rola and Pingali(1993, for Philippine).

Number of doses of insecticide

The use of insecticides has been separated from pesticides on the basis that insecticides are particularly used for cotton crop. Contrary to theoretical expectations number of doses of insecticide has negative impact on willingness to pay. According to marginal effects number of doses of insecticide has positive marginal effects for first three categories of willingness to pay and negative marginal effects for fourth and fifth category of willingness to pay. This relationship may be explained by the phenomenon that farmers are spending huge expenditures to purchase insecticides to secure their crops from pests and there is no alternative or safer pesticides use available to protect their crops. They are not willing to further increase the cost by paying for safer pesticides use. The results are supported by Ajayi (2000, for Cote d'Ivoire) and Rola and Pingali(1993, for Philippine).

Farmer's perception about symptom

The ordered probit model has shown that farmer's perception about symptoms positively impacts the willingness to pay. According to marginal effects farmer's perception about symptom occurrence has negative effect for first three categories and positive marginal effects for fourth and fifth category of willingness to pay. The results are according to the expectations as farmers have perception about negative health effects of pesticide use, they are more likely to pay higher premium for safer pesticides use (see alsoAjayi, 2000 Cote d'Ivoire; Khan, 2009 for Pakistan; Garming and Waibel, 2009 for Nicaragua).

Use of pesticide according to recommended dose

Under the theoretical expectations use of pesticide according to recommended dose should have negative impact on willingness to pay. Ordered probit results have shown negative effect of use of pesticides according to recommended dose on willingness to pay. According to the marginal effects use of pesticide according to recommended dose has positive marginal effects for first four categories of willingness to pay and negative effect for fifth category. The use of pesticides according to recommended dose represents the awareness of the farmer regarding pesticide practices. It may be assumed that they are also familiar with the negative health effects of pesticides. Therefore, they are likely to pay higher premium for safe use of pesticides.

Use of safety measures

The ordered probit regression has shown positive impact of use of safety measures on willingness to pay. According to the marginal effects utilization of safety measures during pesticides use has negative marginal effects for first two categories of willingness to pay and positive marginal effects for last two categories of willing to pay. The explanation may be that these farmers are much conscious about the negative impacts of pesticides on health and are willing to pay higher cost for safer pesticides use.

Working hours

The results have shown that daily working hours of farmers on the farm have positive impact on willingness to pay. According to the marginal effects working hours spent by the farmers on use of pesticides has negative marginal effects for first two categories of willingness to pay and positive marginal effects for last categories of willingness to pay. As farmer spends more time on farm and remains exposed to pesticides and ultimately is willing to pay higher premium for safer pesticides use (Ajayi, 2000 for Cote d'Ivoire).

4. Conclusion and Policy Recommendations

This study evaluated the indirect heath costs of pesticides use in the form of farmer's willingness to pay for safer pesticides. The results express that Willingness to Pay by the Farmers for Safer Use of Pesticides

majority of the farmers are willing to pay higher premium for safer use of pesticides to avoid health cost caused by pesticide use. It explains that farmers are bearing high health cost by use of pesticides. The results expressed that health impairment index, the age of the farmer, farmer's education, number of doses of pesticide used, farmer perception about symptoms, the use of pesticide according to recommended dose and working hours enhance the farmer's willingness to pay for safer pesticides. All these results express that farmers are bearing an indirect health cost of pesticides use. It may be diminished by use of appropriate measures. It is proposed that scientists should focus on research for alternative pest control methods which are less harmful to the human health. Seminars and workshops should be conducted to provide the sufficient information to farmers to increase their knowledge about how the negative effects of pesticides can be avoided by adopting safety measures

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Impact of Foreign Direct Investment and Foreign Remittances on Unemployment in Pakistan: A Time Series Analysis

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Abstract

The present study aims at measuring the impact of FDI and foreign remittances on unemployment in Pakistan. The analysis is carried out by using annual time series data over the period 1972 to 2014. The study has employed the ARDL model. The results reveal that in the long run both FDI and foreign remittances play an important role in reducing the unemployment in Pakistan. However, in the short run their impact is statistically insignificant. The results suggest that appropriate measures ought to be taken by the government to increase the flow of foreign capital in the form of FDI and remittances to reduce unemployment rate in Pakistan.

JEL Classification: C22; F41; O53

Keywords: Foreign Direct Investment; Foreign Remittances; Unemployment; ARDL

I. Introduction

In a modern world, globalization has led the basis of mutual interdependence among various countries of the world and none of the country is self-sufficient in producing all goods and services. Therefore, countries are interlinked with one another through free trade for achieving their requirements (Vijayasri, 2013). In this way, globalization and the availability of foreign capital have created many advantages and opportunities for development of the developing countries. In this regard, the primary and considerable advantage to developing

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countries is the inflow of capital in the form of foreign direct investment (FDI) which helps in modernizing different sectors in these developing countries through better management and improvement in technology leading to raise the employment level (Whyman & Baimbridge, 2006). Furthermore, through the transfer of modern and sophisticated technology from developed to developing countries, FDI tends to enhance the productivity of factors of production, products quality and increases the exports of the host country and finally it stimulates the economic growth (Bacic, *et al.*, 2004).

On the other hand, foreign remittances are also considered an important mechanism for relocating the international assets and resources from developed to developing countries (Russell, 1992). In theory, the impact of remittances is controversial. However, they have very strong positive impacts on economic development of a nation (Connell & Conway, 2000). On the whole, the inflow of foreign remittances increases the economic development and reduces the poverty by increasing the national income of the recipient country, lessening the credit constraints, increasing the investment and employment opportunities and augmenting the human capital by developing the education and health facilities (Stark & Lucas, 1988; Taylor, 1992). In general, for developing nations their significance cannot be denied in light of the fact that they have turned into the second biggest wellspring of foreign financing after FDI in these economies (Ratha, 2003).

Like all other developing nations, attracting the FDI inflows has always remained at the top priority of Pakistan. However, Pakistan failed to magnetizer considerable volume of FDI inflows due to incompatible policies, disappointing judiciary system, lack of political steadiness and macroeconomic discrepancy (Khan, 1997). Increasing international economic prerequisites has encouraged the importance of FDI as a development motivating element of foreign capital flows. Despite its hard efforts Pakistan could not become a safe haven for foreign investors. Consequently, we see a fluctuating trend of FDI inflows to Pakistan over the sample period of the study (see figure 1 in appendix).

On the other hand, the inflow of remittances has been registering a steady increase for the last three decades, nonetheless, remittance income as percent of GDP has depicted a fluctuating behavior for the last four decades (see Figure 2 in the appendix). Currently, Pakistan is facing several problems and unemployment is one of them. Many Pakistani graduates are talented,

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intelligent, and skilled, yet do not get an opportunity to work. During the 1970s and 1980s the unemployment issue was not so much serious but since the 1990s this problem has become alarming despite adopting liberal and open policies (see Figure 3 in the appendix).

The aim of this study is to empirically investigate the effect of FDI and foreign remittances on unemployment in Pakistan by utilizing the autoregressive distributed lag (ARDL) model. In addition, the study examin the relative significance of FDI and foreign remittances in influencing the unemployment in the country. The significance of the present study is evident from two facts. Firstly, the study is pioneer in examining the role of foreign remittances in determining unemployment in Pakistan. This is worth mentioning that previous studies only focus either on exploring relationship between economic growth and foreign remittances or the poverty and remittances nexus in Pakistan. No attempt has been made in the past to gauge the impact of foreign remittances on unemployment in Pakistan. Secondly, the study also incorporates the exports in the analysis which has not been used in the existing literature on Pakistan with regard to the determinants of unemployment.

The rest of the study is structured as follows. Section 2 throws light on the existing relevant literature. The details of the methodology used is given in section 3. The empirical results are given in section 4. Section 5 concludes the study.

2. Review of Literature

The dramatic expansion of high level of unemployment is a big annoyance for developing countries. There is a huge stock of literature on analyzing FDI and employment association but there is a dearth of literature examining the impact of foreign remittances on unemployment. Leon-Ledesma and Piracha (2001) by taking the annual time series data for eleven Central and East European countries have scrutinized the effect of remittances on employment over the period 1990 to 1999. Thestudy finds the strong evidence of positive relationship between remittances and employment. On the other hand, Shaari, et al. (2012) aim at estimating the impact of FDI on unemployment and economic growth in Malaysia over the time period 1980 to 2007 and the OLS technique has been applied. The study reports a negative and statistically significant relationship between FDI and unemployment and a positive and significant relationship between FDI and GDP. The study concludes that the establishment of foreign companies in particular country can provide more jobs and thus total number of unemployed persons falls. Other studies such as Bayar (2014) and Stamatiou and Dritsakis (2014) document a positive relationship between FDI and unemployment for Turkey and Greece respectively.

Drinkwater et al. (2003) employ the panel data of a sample of twenty countries in order to study the role of remittances in labor market dynamics covering the period 1970 to 2000. The findings reveal that remittance income is an insignificant determinant of unemployment but it is positively associated with investment. In contrast, a study by Kim (2007) concludes that remittances are positively related with unemployment because families with remittance earnings have high reservation wage and reduce their labor supply. The studies such as Rizvi and Nishat (2009) by taking the data for Pakistan, India and China over the period 1985 to 2008, and Mehra (2013) by using the Indian data for the period 1970 to 2007 report that FDI inflows have no impact on unemployment. However, Balcerzak and Zurek (2011) find that FDI tends to reduce unemployment in Poland.

In case of Pakistan, Habib and Sarwar (2013) investigate the impact of FDI and other macroeconomic variables (i.e. exchange rate and GDP per capita) on employment. They employ the Johenson cointegration technique using data for the period 1970 to 2011. The findings reveal that FDI and GDP per capita have positive influence on employment whereas exchange rate is negatively related with employment. Maqbool et al.(2013) analyze the relationship between unemployment, FDI, GDP, population, inflation and external debt by using the annual time series data for the period 1976 to 2012 in case of Pakistan. The study finds a negative association between inflation, GDP, FDI, external debt and unemployment but a positive relationship between population growth and unemployment. Using annual data for the period 1983 to 2010, Agil et al. (2014) explore the determinants of unemployment in Pakistan. The findings of the study indicate that FDI and population growth have negative impact on unemployment. Kamran, et al. (2014) inspect the sources of unemployment in Pakistan over the period 1981 to 2010. Using the OLS technique the study documents a positive relationship between FDI and unemployment. Similarly, the relationship between FDI, corruption, population size, inflation and unemployment has been investigated by Zeb et al. (2014). Their study covers the time period 1995 to 2011 while their employed estimation technique is the OLS. The results indicate that FDI negatively affects unemployment. Furthermore, inflation has significant Impact of Foreign Direct Investment and Foreign Remittances on Unemployment in Pakistan

negative relation with unemployment, whereas, corruption and population growth are positively linked with unemployment.

The survey of the literature clearly demonstrates that there is acute shortage of researches germane to explore the relative importance of FDI and remittances in affecting unemployment in the context of Pakistan. Hence, this study is the first attempt in this direction. The other contribution of the study is the inclusion of exports in analysis which has never been incorporated in previous literature concerning the issue of unemployment in Pakistan.

3. Analytical Framework

Concerning the theoretical view point on FDI it is widely believed that Greenfield investment has the potential to generate maximum employment opportunities in an economy (Hisarciklilar, et al., 2014). Stark (1991) is of the view that that no general theory of remittances exists in the existing literature. However, the theory of new economics of labor migration draws some intention towards the impact of remittances on the economy. According to this theory remittances have positive impact on macroeconomic development of the home country (Taylor, 1999). Moreover, following the search matching model of the labor market developed by Drinkwater et al. (2006) foreign remittances can have two opposite effects on the unemployment rate. Firstly, given risk averse workers, they increase search utility and the impact on the unemployment rate can be both positive and negative. Secondly, they relax the credit constraint facing firms, raising the capital stock towards its optimal level and reducing the unemployment rate. When remittance income is sufficiently high, the optimal capital stock is reached and any further increase has only the search effect.

Following Maqbool, *et al.* (2013) and Arslan and Zaman (2014), we estimate the following mdoel,

$$UEMP_{t} = \hat{a}_{0} + \hat{a}_{1}FDI_{t} + \hat{a}_{2}REM_{t} + \hat{a}_{3}INF_{t} + \hat{a}_{4}GDPGR_{t} + \hat{a}_{5}LOP_{t} + \hat{a}_{6}X_{t} + u_{t}$$

The description of variables used in equation (1) along with their data sources are presented in Table 1.

| Variable | Description | |
|----------|---|--|
| UEMP | Unemployment (% of labor force) | |
| FDI | FDI, net inflows (% of GDP) | |
| REM | Foreign Remittances (% of GDP) | |
| INF | Growth Rate of Consumer Price Index (CPI) | |
| GDPGR | GDP growth (annual %) | |
| LOP | Natural Log of Oil Prices (rupees per barrel) | |
| Х | Exports of goods and services (% of GDP) | |

Table 1: Variable Description

We have already discussed the likely impact of FDI and remittances on unemployment. With regard to the relationship between inflation and unemployment the Phillips curve suggests a tradeoff between inflation and unemployment: the higher the inflation, the lower will be rate of unemployment and vice versa. High GDP growth is theoretically expected to bring a reduction in unemployment. The theoretical relationship between GDP growth and unemployment is strongly supported by the notion of Okun's law (1962). Higher oil priceis expected to cast a negative impact on employment because it results in higher input cost which in turns squeezes the wages and lowers production leading to increase unemployment in the economy (Brown and Yucel, 2002). The last important explanatory variable is exports which has an expected negative impact on the unemployment rate as exports are important source of foreign exchange earnings that can be used for enhancing productive capacity of the economy. Therefore, the rise in exports tends to increase the economic growth and employment in various sectors of the economy (i.e. mining, industry, agriculture etc) and consequently unemployment rate falls.

The study has accomplished its empirical task using time series data for the period 1972 to 2014 for Pakistan. The required data are obtained from

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Pakistan Economic Survey (various issues), World Development Indicators, the World Bank, and US Energy Information Administration.

The study has employed the ARDL co integration technique developed by Pesaran *et al.* (2001). This technique is considered quite useful in obtaining consistent parameter estimates even if the order of integration of variables is mixed i.e. I (0), and I (1). Moreover, it is capable enough to yield efficient and consistent empirical results for the small data size. We can express the model (1) within the ARDL specification as follows:

$$\Delta UEMP_{t} = \alpha_{0} + \sum_{i=1}^{\rho} \alpha_{1} \Delta UEMP_{t-i} + \sum_{i=0}^{\rho} \alpha_{2} \Delta FDI_{t-i} + \sum_{i=0}^{\rho} \alpha_{3} \Delta REM_{t-i} + \sum_{i=1}^{\rho} \alpha_{4} \Delta INF_{t-i} + \sum_{i=2}^{\rho} \alpha_{5} \Delta GDPGR_{t-i} + \sum_{i=1}^{\rho} \alpha_{6} \Delta LNOP_{t-i} + \sum_{i=0}^{\rho} \alpha_{7} \Delta X_{t-i} + \beta_{1} UEMP_{t-1} + \beta_{2} FDI_{t-1} + \beta_{3} REM_{t-1} + \beta_{4} INF_{t-1} + \beta_{5} GDPGR_{t-1} + \beta_{6} LNOP_{t-1} + \beta_{7} X_{t-1} + \nu_{t}$$

$$(2)$$

In equation (2), the coefficients attached with difference operators measure short-run dynamics, whereas, the terms with first lagged captures the long run relationship. Here the null hypothesis of no long-run relationship

 $(\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0)$ is tested against the alternative hypothesis of the presence of long run relationship $(\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq 0)$. The short run dynamics and the stability of the model is explored through the error correction model (ECM) which can be expressed as follows.

$$\Delta UEMP_{t} = \delta_{0} + \sum_{i=1}^{\nu} \delta_{1} \Delta UEMP_{t-i} + \sum_{i=0}^{\nu} \delta_{2} \Delta FDI_{t-i} + \sum_{i=0}^{\nu} \delta_{3} \Delta REM_{t-i} + \sum_{i=1}^{\nu} \delta_{4} \Delta INF_{t-i} + \sum_{i=2}^{\nu} \delta_{5} \Delta GDPGR_{t-i} + \sum_{i=1}^{\nu} \delta_{6} \Delta LNOP_{t-i} + \sum_{i=1}^{\nu} \delta_{7} \Delta X_{t-i} + \eta ECT_{t-1} + e_{t}$$
(3)

where, ECT_{t-1} is the error correction term and η indicates the speed of adjustment which is linked to cointegration equation. This term actually represents the feedback of the system in stabilizing its disequilibrium.

4. Results and Discussion

We begin our estimation task by checking the stationary properties of the variables. Table 2 reports the result of the Augmented Dickey-Fuller (ADF) unit root test applied to determine the order of integration of the time series used in the study. The results clearly indicate that the variables FDI and GDPGR are stationary at level, whereas, other variables are non-stationary at level but they become stationary after taking the first difference. It shows that the variables are a purely combination of I(0) and I(1) and none of them is

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integrated of order (2), which makes a suitable case for employing the ARDL model. Thus, we proceed further with our empirical analysis by applying the ARDL technique.

| | | | Mackinnon Critical Values for Rejecting the Unit Root Hypothesis | |
|----------|--------|---------------------|---|-------------------------|
| Variable | Level | First Difference | 5% | Order of Integration |
| UEMP | -2.048 | -6.179 | -3.523 | <i>I</i> (1) |
| FDI | -4.884 | | -3.540 | I (0) |
| REM | -1.684 | -4.907 | -3.523 | <i>I</i> (1) |
| INF | -3.415 | -7.678 | -3.523 | <i>I</i> (1) |
| GDPGR | -5.663 | | -3.540 | I(0) |
| LOP | -2.563 | -5.786 | -3.523 | <i>I</i> (1) |
| X | -1.630 | -6.225 | -3.523 | I(1) |

Table 2: Results of ADF Test

As a first step, we apply bound test in order to check the long run relationship between dependent and independent variables. On the basis of F-statistic, the decision regarding cointegration is taken. Results of bound test are presented in Table 3.

Table 3: Results of Bound Test

| Significance Level | Cri | F- Statistic | |
|--------------------|-------------|--------------|-------|
| | Lower Bound | Upper Bound | |
| 10 % | 2.12 | 3.23 | |
| 5 % | 2.45 | 3.61 | 5.054 |
| 2.5 % | 2.75 | 3.99 | |
| 1 % | 3.15 | 4.43 | |

The results reveal that the value of calculated F-statistic is 5.054, which is
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greater than the upper bound critical values at 10%, 5 %, 2.5 %, and 1% levels of significance. Based on the finding the null hypothesis of no long run relationship is rejected. Thus, we conclude that a cointegrating vector exists when unemployment is taken as dependent variable. In the second step we obtain the long run parameter estimates of repressors. To this end, we use the SBC for the optimal lag length selection of all the variables of the model. The optimal lag length for each variable is shown as ARDL (1, 0, 0, 1, 2, 3, 0). The long run estimates of ARDL model are presented in Table 4.

Table 4: Estimated Long Run Coefficients

| Variable | Coefficient | t-value |
|----------|-------------|---------|
| FDI | -0.115*** | -6.105 |
| REM | -0.066** | -2.505 |
| INF | - 0.211*** | -4.950 |
| GDPGR | - 0.570*** | -2.742 |
| LOP | 0.319* | 1.732 |
| Х | - 0.369*** | -2.965 |
| С | 1.472** | 2.616 |

Dependent Variable: UEMP

Note: ***, ** and * indicate significant at 1 percent, 5 percent, and 10 percent levels respectively.

The results reveal that FDI, foreign remittances, inflation rate, GDP growth, and exports have a negative long run impact on unemployment while oil price has a positive impact on unemployment. It is obvious from Table 4 that one percent increase in FDI leads to 0.115 percent decrease in unemployment rate in Pakistan. The relationship is logical because high FDI inflows, especially establishment of foreign companies in an economy provide more jobs opportunities. Moreover, FDI facilitates in expanding the business size by providing the technical know-how to the domestic investors, augments human capital, and improves the managerial skills. All this results in enhancing business activities and hence paves the way

for more jobs in an economy. This finding is consistent with the empirical evidence provided by Habib and Sarwar (2013) Maqbool et al. (2013), Agil et al. (2014), Arslan and Zaman (2014) and Zeb et al. (2014) for Pakistan as all these studies have documented the unemployment reducing role of FDI. Nonetheless, our result contradicts the positive association between FDI and unemployment as provided by Kamran et al. (2013) for Pakistan. The coefficient of foreign remittances variables carries a negative sign which suggests that one percent increase in foreign remittances is associated with a 0.066 percent reduction in unemployment in Pakistan. Remittances reduce unemployment by lessening the credit constraints and motivate the business enterprises to expand their business and make jobs available. This result is in line with the empirical findings of Loen-Ledesma and Piracha (2001) and Drinkwater et al. (2003) for various developing countries including Pakistan, whereas, it is in sharp contrast with what has been reported by Kim (2007) for Jamaica. Inflation rate is appearing to be statistically significant at 5 percent level of significance. The result reveals that one percent rise in inflation rate leads to 0.211 percent decline in unemployment. This result supports the findings of Zeb et al. (2014) who argue that unanticipated increase in price level decreases the real wage which will make the situation more favorable for producer; hence, they increase labor demand which ultimately leads to lower unemployment in an economy in the long run. Moreover, this outcome is also in line with the notion of the Phillips curve.

There exists a negative relationship between growth rate of GDP and unemployment in such a way that one percent rise in GDP growth tend to reduce unemployment in the economy by 0.57 percent. The inverse relationship between GDP and unemployment has already been postulated by the Okun's law and by the empirical studies such as Rizvi and Nishat (2009) and Kabaklarli et al. (2011), among others. Since Pakistan is the net importer of oil so the changes in oil price play a crucial role in affecting the macroeconomic variables. The oil price has very devastating effect on macroeconomic variables such as unemployment, inflation and GDP growth (Shaari et al., 2012). The empirical result presented in table 4 indicates that the coefficient of the variable oil prices is statistically significant at 10 percent level and it is positive which means that 1 percent rise in world oil price will cause 0.319 percent increase in unemployment rate Pakistan in the long run. This outcome supports the findings of Rabalo and Salvado (2008), and Ahmad (2013) that upward pressure in oil prices upshots the higher production cost leading to make it quite difficult for production and business activities to sustain themselves. The situation may deteriorate further with the net outcome rise in the number of jobless individuals in the economy. Finally, the study finds strong support in favor of a significant and negative relationship

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between exports and unemployment such that a 0.369 percent decrease in unemployment is associated with 1 percent increase in exports. The finding is supported by Dizaji and Badri (2014) who argue that higher exports lead to higher competition among different industries and the production units, increase the labor productivity, improve the quality and diversification of the products which result in production process development and more employment opportunities.

| Variable | Dependent Variable: UEMP Coefficient | t-value | |
|-------------------------|---|---------|--|
| ΔFDI | -0.018 | -0.105 | |
| Δ REM | 0.053 | 0.583 | |
| Δ INF | -0.023* | -1.753 | |
| Δ GDPGR | -0.007 | -0.112 | |
| Δ GDPGR (-1) | 0.133** | 2.356 | |
| $\Delta LOG(OP)$ | 0.580 | 1.299 | |
| $\Delta LOG(OP(-1))$ | 0.611 | 1.099 | |
| $\Delta LOG(OP(-2))$ | 0.835 | 1.411 | |
| Δx | -0.186** | -2.544 | |
| ECT_1 | -0.504*** | -3.389 | |
| R ² | 0.613 | | |
| Adjusted R ² | 0.420 | | |
| F-statistic | 3.176 | | |
| Prob(F-statistic) | 0.005 | | |

Note: ***, ** and * indicate that coefficients are significant at 1 percent, 5 percent, and 10 percent level of significance respectively.

The next step after estimating the long-run coefficient is to estimate the ECM. Table 5 reports the results for the ECM. The coefficient of ECT is statistically significant at 5 percent level of significance and it carries a negative sign which is desirable. Therefore, the result indicates that the long run equilibrium relationship between unemployment and the explanatory variables is stable. The coefficient of ECT or the speed of adjustment is -0.504 suggesting that in case of any disturbance in the long run equilibrium position, the forces of the model will restore the equilibrium at the speed of 50 percent each year. Moreover, it is found that in the short run FDI, inflation rate, GDP growth and exports influence the unemployment inversely, whereas, foreign remittances and world oil price impact unemployment positively. However, the impact of all the variables is insignificant except INF and X. Hence, FDI and remittance income play their role in reducing unemployment in Pakistan only in the long run while they fail to bring any change in the unemployment rate in the country. This outcome can be justified on the ground that both FDI and remittances require time to expand the productive capacity of an economy and establishing a business encouraging environment in the economy for raising employment rate.





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Figure 2: Result of CUSUM of Squares Test

Finally, Cumulative Sum (CUSUM) and CUSUM of Squares test are applied in order to check the stability of the estimated parameters of the model. Figure 1 displays the results of CUSUM test whereas figure2 shows the results of CUSUM of Squares test. Results of CUSUM and CUSUM of Squares test reveal that the estimated lines are within the critical limits at 5 percent level of significance. Therefore, it is confirmed that parameters of the model remained stable during sample period of the study.

5. Conclusion

Unemployment is a serious concern for policymakers as it creates financial, moral and social hazards in an economy that may hamper the pace of economic growth and development. Like other developing countries reducing unemployment has been the core of macroeconomic policies in Pakistan. The role of FDI and remittances has become crucial in the management of Pakistan's economy. Therefore, the present study has focused on gauging the impact of FDI and foreign remittances on unemployment in the country. For this purpose the study has selected the time period from 1972 to 2014 and the empirical task has been carried out by means of the ARDL technique.

The findings indicates that FDI, foreign remittances, inflation, GDP growth and exports has significant negative impact on unemployment in the long run. On the other hand, in the short run FDI, inflation rate, GDP growth and exports have negative impact on unemployment, however, only the impact of

inflation and exports is significant. Moreover, foreign remittances and world oil price have positive but insignificant effects on unemployment. FDI has a greater impact on unemployment relative to foreign remittances in the long run which implies that foreign remittances are mainly used for consumption purposes in Pakistan. Unfortunately, the policy makers in Pakistan have failed to chalk out a convincing plan to divert the remittance income towards productive use. The findings of the study lead to the following policy recommendations. Firstly, as FDI is negatively related with unemployment, hence, government should take appropriate measures to attract FDI and foreign capital in Pakistan. In this regard, it is imperative to create a business friendly and peaceful environment in the country. For this purpose, improving infrastructure facilities, providing better law and order state, overcoming energy crisis and existence of political stability are crucial to craft investment conducive climate to enhance the volume of FDI in Pakistan. Secondly, for enhancing their unemployment reducing role, remittances can be redirected from current consumption towards productive investment by offering higher interest rate on deposits or subsidies for productive investment. In addition, government should facilitate investment by Pakistani diaspora in real estate and industrial enterprises through the provision of tax holidays and without any requirement for a national tax number. Finally, for bringing a significant decline in unemployment rate, exports ought to be increased. For this purpose, there is a need to increase the production of goods and services in all sectors in general but in exportable sector in particular. Moreover, export diversification should be given top priority for which we need to diversify the production base in favour of goods and services with comparative advantage, global demand and growth potential.

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Appendix



Figure 1: FDI Inflows to Pakistan (1972-2014)

Source: World Development Indicators (WDIs).





Source: Pakistan Economic Survey (various issues).

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Source: Pakistan Economic Survey (various issues).

Impact of Monetary and Other Economic Uncertainties on Demand for Money: Evidence from Pakistan

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Abstract

The study investigates the impact of monetary and other economic uncertainties on demand for money for Pakistan in the short run as well as in the long run. To comprehend this objective the auto regressive distributed lag (ARDL) bounds testing approach and error correction model (ECM) developed by Pesaran et al. (2001) are employed to annual data for the period of 1970 to 2014. The empirical results reveal that in the short run both measures of uncertainty are significantly related to demand for money in Pakistan. Whereas, in the long run monetary uncertainty does not influence money demand while other economic uncertainties have long run negative impact on demand for money. The results also indicate that there is long-run relationship between demand for money and other factors considered in the analysis. The findings of ECM supports co-integration among the variables and that the dependent variable adjusts towards equilibrium level with the speed of 51 percent per year. To check the stability of money demand function in the presence of monetary and other economic uncertainties, CUSUM and CUSUMSQ tests are applied to the residuals of the model. The findings of both tests confirm the stability of long run money demand function for Pakistan.

JEL Classification: E41; E42; E52

Keywords: Demand for money; monetary uncertainty; stability; economic uncertainty

1. Introduction

Money demand has a crucial role both in macroeconomics and monetary economics. In macroeconomics, it has a general impact through transaction, speculation and precautionary motives while in monetary economics it

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has a specific role to play regarding the performance of monetary policy. According to the perception of conventional economics, real demand for money is a function of income and interest rate. The rise in income has the tendency to enhance money demand while the increase in rate of interest declines the desire of economic agents to keep money with them. Monetary uncertainty is also a determinant of money demand which has positive impact on demand for money (Friedman (1984)). When supply of money becomes more uncertain, people raise their demand for money and velocity of money declines. Economic uncertainty is another important determinant of money demand highlighted in the literature (Bahmani-Oskooee & Xi, 2011). The impact of economic uncertainty on money demand is uncertain. It can be positive as in the period of high economic uncertainty a risk averse agent prefers to hold safe and liquid assets. It can be negative in the sense that if monetary value is expected to decline in future due to economic uncertainty, then the economic agents are expected to prefer holding of other assets such as gold and commodities instead of risky assets. Therefore the omission of uncertainty variables from money demand model can result in invalid conclusions which can also influence the monetary policy planning. Thus it is important to include economic and monetary uncertainty variables in money demand equation. The prevailing literature points to the fact that considerable attention has been paid to the investigation of money demand function and its determinants in emerging economies like Pakistan since 1970. However, these earlier studies on demand for money examined just the very common determinants by applying different techniques and have ignored the role of uncertainties as determinants of money demand in Pakistan.

This study is an attempt to fill this gap in the literature on money demand function in Pakistan. Hence the study inclined to revisit the demand for money function in Pakistan by adding two more factors i.e. monetary uncertainty and economic uncertainty. The study also contributes to the available literature on demand for money in Pakistan by investigating whether monetary uncertainty and economic uncertainty along with real income, price level, interest rate and exchange rate plays any role in the stability of monetary aggregate M2 in Pakistan. This study aims to appraise the demand for money function of Pakistan for the time period of 1970 to 2014. To accomplish this aim, the study applies the error correction representation of ARDL model. The stability of money demand function is checked by applying CUSUM and CUSUMSQ tests to the residuals of the model.

The rest of the study is organized as follows. Section 2 reviews literature on the issue. Section 3 contains model specification and estimation technique. Source of data, variable description and construction are discussed in section 4. Section 5 interprets the empirical results. The last section presents conclusions of the study.

2. Literature Review

In 1982 there was a huge decline in income velocity of money which causes real GNP to fall in USA. According to Friedman's volatility hypothesis (1984) this decline in velocity was due to increase in volatility of money supply because of announced variations in the operating techniques of Federal Reserve in October 1979. Whenever money supply becomes more volatile the demand for money increases and velocity declines which in turn reduces GNP (Hall & Noble, 1987). Friedman's volatility hypothesis failed in case of Germany (Bruggemann & Nautz, (1997)), Oskooee and Bohl (2000)) while it did hold for the USA (Choi & Oh, 2003).

Both monetary and economic uncertainties are important determinants of money demand. It is evident from the evidence found by Hun Lee and Chung (1995), Bahmani-Oskooee and Bahmani (2014) for Korea, Jackman (2010) and Atta-Mensah (2004) for Canada, Oskooee et al. (2012) for China, Oskooee and Xi (2014) for six Asian countries³, Kones (2014) for 21 African countries⁴, Kiptui (2014) for Kenya. The studies conducted on different Asian countries such as Ibrahim (1998, 2001) for Malaysia, Khan (1992) for India and Pakistan, Baharumshah et al (2009) for China, Kundu and Mollah (2014) for Bangladesh, Ajmi et al. (2015) for ten Asian countries⁵, Apergis, (2015) for East Asian countries, Tang (2007) for five countries of South Asia i.e. Indonesia, Singapore, Malaysia, Philippine and Thailand, proved that the long run demand for money function was stable for these Asian countries.

A number of studies also estimated money demand function for Pakistan by applying different techniques and got diverse results such as Khan (1982) examined the demand for money function in six developing nations of Asia. A significant relationship of expected inflation rate with money demand was found for Pakistan, Korea and Sri Lanka. The study also suggested

³Malaysia, Indonesia, Singapore, Pakistan, India and Philippine

⁴Burundi, Cote d'Ivoir, Burkina Faso, Cameroon, Ethiopia, Gabon, Egypt, Ghana, Kenya, Morocco, Niger, Madagascar, Nigeria, Senegal, Mauritius, Seychelles, Rwanda, Sierra Leone, Tanzania, South Africa, and Togo.

⁵Malaysia, Singapore, Indonesia, Korea, Japan, India, China, Philippines, Fiji and Hong Kong

that interest rate has a considerable role in determining the opportunity cost of holding money in Pakistan. Nisar and Aslam (1983) also observed the same results regarding significance of interest rate for Pakistan. Khan and Sajjid (2005) investigated a long run stable relationship between demand for money and real variables i.e. rate of inflation, real income, foreign interest rate, and real effective exchange rate. Haider et al. (2013) also discovered a stable money demand function for Pakistan. Other studies which examined money demand function for Pakistan includes "Akhtar (1974), Abe et al. (1975), Mangla (1979), Khan (1980,1982), Nisar and Aslam (1983), Sarwar et al. (2010), Azim et al. (2010), Qayyum (2001, 2005), Khan and Sajjid (2005), Omer (2009), Anwar and Asghar (2012), Mall (2013), Naseer (2013) , Faridi and Akhtar (2013), Haider et al. (2013)". A common feature of all these studies is that they analyze the relationship of money demand with its determinants by applying different techniques. Most of these studies also checked the stability of money demand function for Pakistan using CUSUM and CUSUMSQ tests.

2.1 Literature Gap

The literature reviewed above make it clear that no study⁶ has been conducted on Pakistan by considering uncertainties (monetary and other economic). Therefore this study estimates the relationship of money demand with monetary and other economic uncertainties and also checks the impact of these uncertainties on the stability of money demand for Pakistan.

3. Model Specification

Real or nominal GDP, price level, interest rate and exchange rate are considered as main determinants of money demand in every country. Money demand function for Pakistan has no exception. Therefore we identify the demand for money function which relates the demand for broad money M2 to real GDP, nominal effective exchange rate, price level, interest rate and two measures of uncertainty (monetary and economic). The leading model of money demand for Pakistan is presented in equation (1) which is a standard specification:

⁶Bahmani-Oskooee (2014) conducted a study on Asian countries including Pakistan similar to our study. but we started work independent of it and it was not available on internet at that time. Our study is different in one aspect; we measure economic uncertainty by an index of five variables, while Bahmani-Oskooee (2014) measured it by a single variable (GDP).

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$$LM_{t} = \beta_{\circ} + \beta_{1}LY_{t} + \beta_{2}LP_{t} + \beta_{3}R_{t} + \beta_{4}LEX_{t} + \beta_{5}V_{t} + \beta_{6}EU_{t} + \varepsilon_{t}$$
(1)

L is the log of variables.

The equation (1) states that real money demand is the function of real GDP, price level, interest rate, nominal effective exchange rate and two uncertainty variables (monetary and economic). V represents monetary uncertainty while EU is economic uncertainty index. Following the literature, the sign of β_1 and β_2 are anticipated to be positive, β_3 to be negative. β_4 could be positive or negative depending on the value of exchange rate. Increase in exchange rate reflects decline in the home currency value. Thus with the rise in exchange rate the value of overseas possessions in the form of home currency increases, that is rise in the value of assets, which may give rise to money demand. However if there is an expectation of further decline in value of currency, it may lead to increase in demand for foreign currency or decrease in demand for domestic currency. β_5 and β_6 could take any sign. If a measure of uncertainty persuades people to be more careful and to hold more liquid assets, value of coefficients will be positive. However, if any measure of uncertainty (monetary or economic) creates substitution effect so that people move away from holding cash towards less volatile assets then the signs of β_5 and β_6 can be negative.

In order to estimate the short run and the long run coefficients equation (1) is transformed into error correction format. Thus, following the ARDL bound testing approach of Pesaran et al. (2001), we have the following equation:

$$\Delta LnM_{t} = \alpha_{\circ} + \sum_{i=1}^{n} \alpha_{1} \Delta LM_{t-i} + \sum_{i=0}^{n} \alpha_{2} \Delta LY_{t-i} + \sum_{i=0}^{n} \alpha_{3} \Delta LP_{t-i} + \sum_{i=0}^{n} \alpha_{4} \Delta LEX_{t-i} + \sum_{i=0}^{n} \alpha_{5} \Delta r_{t-i} + \sum_{i=0}^{n} \alpha_{6} \Delta V_{t-i} + \sum_{i=0}^{n} \alpha_{7} \Delta EU_{t-i} + \rho_{\circ} LM_{t-1} + \rho_{1}LY_{t-1} + \rho_{2}LP_{t-1} + \rho_{3}LEX_{t-1} + \rho_{4}r_{t-1} + \rho_{5}V_{t-1} + \rho_{6}EU_{t-1} + \varepsilon_{t}$$

$$(2)$$

The 2^{nd} equation is the error correction representation of ARDL model. This is a bit different from the standard error correction model in the sense that all variables from equation (1) are included in equation (2) in their lagged level form instead of including lagged error term. This specification is mostly favored by Pesaran et al. (2001) because by estimating equation (2) the short run and long run effects of variables can be found in one step

estimation. The estimates of the coefficients $\alpha_1, \alpha_2, ..., \alpha_7$, reflects the short run effects while $\rho_1, \rho_2, ..., \rho_6$ normalized by ρ_2 reflects the long run effects. However, in order to make estimates of the long run coefficients meaningful, there is need to check co-integration among the variables.

To establish co-integration Pesaran et al. (2001) proposed a nonstandard F test (also called bound test), which has new critical values for joint significance of lagged level variables. They provide the upper bound and lower bound critical values. For the existence of co-integration among variables, the calculated F statistics should be greater than the upperbound critical value. However if the test statistics lies below the lower bound then the null hypothesis of no co-integration is accepted. If the test statistic lies between the upper and lower bounds, the results are considered as inconclusive. Co-integration is checked by applying F-test on the output of equation 2. Equation (1) is estimated to get the residuals which are further used as error correction term. Equation (2) is re-estimated by replacing the variables representing long run relationship (lagged level variables) with the lagged error correction term. The estimated value of error correction term will provide evidence for co-integration among variables and also shows the adjustment of variable towards equilibrium only if it has significantly negative value.

4. Source of Data, Description and Construction of Variables

Annual data for the period of 1970 to 2014 are collected from different issues of Economic Survey of Pakistan, annual reports of the State Bank of Pakistan and International Financial Statistics (IFS). Detail of variables is given bellow:

M2= real money supply. Its data is obtained from annual reports of SBP.

Y= GDP at constant market prices. The data is taken from economic survey of Pakistan.

- P= log of CPI. CPI data is also obtained from economic survey of Pakistan
- EX= nominal effective exchange rate. It is defined as the value of dollar in terms of rupee. Its data is taken from IFS.
- R= interest rate as Govt bond yields. Its data is also taken from IFS.

V= monetary volatility. It is estimated by applying GARCH (1,1) technique on monthly data of nominal M2. Monthly data of nominal M2 is taken from monthly bulletins of the State Bank of Pakistan. The volatility calculated from monthly data of M2 is then converted into annual volatility by taking the average of every 12 monthly observations. EU= economic uncertainty index. It is the index of five variables which are; government expenditures, exports, imports, foreign remittances and foreign direct investment (FDI). Volatility of variables is calculated by taking the standard deviation of each five observation through rolling method. The index is then constructed by putting values in the formula:

$$EU = \sum_{i}^{n} \gamma_{i} \left(\frac{(V_{i} - \overline{V_{i}})}{\delta_{v}} \right)$$

where V_i shows the volatility of variable 'i', $\overline{V_i}$ is the average volatility, δ_v δ_v is the standard deviation of volatility and γ_i represents the actual weights attached to each factor.

5. Discussion and Interpretation of Results

One of the preconditions of ARDL model is that, none of the variables should be I(2) and It can be used with a mixture of I(0) and I(1) variables. Therefore the Augmented Dickey Fuller (ADF) unit root test is applied to all variables both at level and first difference to check time series properties of variables. The results of the test are reported in table 1. Which indicates that all variables are stationary at first difference except interest rate which is stationary at level I(0). The results also shows that no one of the variables is I(2). Thus it provides the validation for ARDL bound testing approach to be used for examining the determinants of money demand for Pakistan.

Table 1: Results of ADF Test

 Null hypothesis: There is unit root in the data

 At level
 Optimal
 At first
 Optimal

| At level | Optimal lags | t-statistics | At first difference | Optimal Lags | t-statistics |
|----------|-----------------|--------------|---------------------|-----------------|--------------|
| LM2 | 0 | -0.2567 | DLM2 | 0 | -5.3597*** |
| LY | 0 | -1.2106 | DLY | 0 | -4.7118*** |
| LP | 1 | -1.1902 | DLP | 0 | -3.3595** |
| LEX | 0 | -2.0640 | DLEX | 0 | -5.0113*** |
| R | 1 | -3.2916** | DR | 1 | -5.7099*** |
| V | 0 | -1.9770 | DV | 0 | -4.6227*** |
| EU | 0 | -1.6036 | DEU | 0 | -5.6549*** |

Note: *** and ** represents significant at 1% and 5% level of significance respectively

The first step in application of error correction model is the optimal lag selection for each variable. First we impose 3 lags on each first differenced

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variable and just one lag on level variables and estimate the equation. The insignificant lags are dropped out one by one through Schwarz Criteria (SC). The short run coefficients are reported in table 2 while the table 3 reports long run estimates of ARDL model. It is clear from table 2 that at least two coefficients of each variable are significant which means that monetary and economic uncertainties along with all other variables have short run significant impacts on money demand. The same result was found by Bahmani-Oskooee et.al (2012) for China and Choi and Oh (2003) for USA.

| Lag Order | | | | |
|------------|-----------|-----------|-----------|-----------|
| Variables | 0 | 1 | 2 | 3 |
| DLM2 | | 0.3859*** | 0.2192*** | 0.2813*** |
| | | (3.91) | (3.16) | (3.98) |
| DIV | 1.3318*** | 1.2532*** | 2.1676*** | 1.3014*** |
| DLY | (4.65) | (3.69) | (6.42) | (4.53) |
| DLP | -0.836*** | 0.9120*** | | -0.2881 |
| | (6.04) | (6.47) | | (1.36) |
| DLEX | -0.170*** | | | 0.4521*** |
| | (3.199) | | | (7.37) |
| DD | -0.002 | 0.0157*** | 0.0052* | 0.0179*** |
| DR | (1.01) | (5.52) | (2.03) | (8.38) |
| -0 DV (| -0.003** | 0.0022*** | | 0.0010 |
| | (2.53) | (3.19) | | (1.79) |
| DEU | -0.001** | 0.0005 | 0.0021*** | 0.0016*** |
| | (2.24) | (1.34) | (7.75) | (5.50) |

Table 2: Estimates of Short-Run Coefficient

Note: *, **and *** represents significant at 10%, 5% and 1% level of significance respectively Figures in parenthesis represent t-statistics value

Table 3 shows that coefficients of all variables except monetary uncertainty are significant and have their expected signs. The real GDP and price level have positive signs which are according to economic theory.

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| Variables | Coefficients | t-statistics | p-value |
|-----------|--------------|--------------|---------|
| C | 8.5394 | 4.6569 | 0.0009 |
| LY | 0.3479 | 2.413 | 0.0365 |
| LP | 0.4479 | 5.204 | 0.0004 |
| LEX | -0.2327 | 5.523 | 0.0003 |
| R | -0.0173 | 3.903 | 0.0029 |
| V | 0.0014 | 1.206 | 0.2557 |
| EU | -0.0019 | 3.398 | 0.0068 |

Table 3: Estimates of Long run Coefficients

R-squared= 0.99 Adjusted R-squared= 0.97 F-statistic= 40.08 Prob(F-statistic)= 0.000 Durbin-Watson stat= 2.078

The findings of the study are consistent with the findings of almost all studies conducted on money demand for Pakistan and other countries such as Akhtar (1974), Hun Lee and Chung (1995), Ibrahim (1998, 2001) Choi and Oh (2003), Atta-Mensah (2004), Qayyum (2001, 2005), Anwar and Asghar (2012), Naseer (2013), Bahmani-Oskooee and Bahmani (2014), Bahmani-Oskooee et.al (2012) and Apergis (2015).

The other variables such as R, EX and EU are negatively related to demand for money. The reason for the inverse relation between exchange rate and money demand may be that a rise in EX indicates decrease in value of domestic currency (M2) due to which demand for M2 declines. People convert their holdings (in the form of M2) into foreign assets due to expectations of further decline in the value of domestic currency. Similarly whenever interest rate gets higher, the returns on saving deposits and other assets increases which in turn raises the opportunity cost of holding money. Therefore people prefer to hold alternatives to money and hence demand for money declines. This is consistent with theory and in line with the findings of Mangla (1971), Ibrahim (2001), Inoue and Hamori (2008) and Kiptui (2014) for different countries. All these studies found that both interest rate and nominal exchange rate have significant but inverse relationship with money demand. However the relationship of monetary uncertainty with money demand is statistically insignificant for Pakistan in the long run. This result is consistent with the results of Oskooee and Wang (2014), Kones (2014). The reason for insignificant coefficient of monetary uncertainty can be the less

volatile behavior of M2 money supply in Pakistan. The less volatile behavior is predicted from very small values of volatility series for money supply calculated through GARCH technique.

The negative and small value of coefficient of economic uncertainty means that although its impact on money demand is negative but very small in case of Pakistan. The inverse relationship of economic uncertainty with demand for money is supported by the findings of Bahmani-Oskooee and Xi (2014) for Malaysia and Indonesia. However, to make these long run coefficients meaningful it is necessary to establish co-integration among these variables. Therefore we move towards Table 4.

 Table 4: Results of Diagnostic Tests

| F-statistic | ECM_{t-1} | $\operatorname{Adj}_{R^2}^{R^2}$ | LM | CUSUM | CUSUMSQ |
|-------------|-------------------|----------------------------------|------------------|--------|---------|
| 25.9206 | -0.5123 (3.68) | 78.60 | 4.8465 (0.09) | Stable | stable |

The ARDL bound test result shows that the value of F-statistic is much higher than upper bound critical value (3.61). Therefore the hypothesis of co-integration among variables is accepted.

Next, we run the regression of real demand for money on its determinants at level to get the error correction term. The lagged level variables are then replaced with the lagged level error correction term (EC_{t-1}). The resultant equation is re-estimated. A negative significant value of error correction term is obtained which indicates the adjustment of money demand towards equilibrium at the speed of 51% per year. The value of Long-range multiplier (LM) test is also reported in the table which is applied to check serial-correlation. The LM statistics is much smaller than the critical value 9.48, which is an evidence of no serial correlation in the residuals.

One of the objectives of the study is to check the stability of money demand function for Pakistan in the presence of uncertainties variables. Therefore after estimating the money demand function, we check its stability with the help of CUSUM and CUSUMSQ tests proposed by Brown et.al (1975). The results of the tests are presented in figure 1 and 2. The dotted straight lines in both figures signify the critical bounds at 5% level of significance. Both figures show that money demand function is stable even

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with the introduction of two new variables in the model because the test lines lie inside the critical bounds.



Figure 2 CUSUMSQ test to the residuals of equation (2)



6. Conclusion

The demand for money in any country depends upon the price level, real income, opportunity cost variable and the exchange rate. However, the monetary and economic uncertainties are also considered as the important variables affecting demand for domestic currency. Both the variables can have a positive or negative relationship with the demand for money. The purpose of this study is to investigate the impact of monetary and other economic uncertainties on the demand for money in Pakistan. For this purpose the money demand function was estimated by applying ARDL bound testing approach of Pesaran et al. (2001). The monetary uncertainty was calculated through GARCH model while economic uncertainty was obtained through standard deviation. It is concluded that both measures of uncertainty are significantly related to demand for money in the short run. But in the long run only economic uncertainty has significantly negative impact on money demand, while monetary uncertainty has no effect on demand for money in the long run for Pakistan. The negative impact of economic uncertainty justifies the substitution effect due to which people move away from holding cash towards less volatile assets. In addition to it, it is also concluded that money demand function is stable for Pakistan even in the presence of both uncertainty variables (monetary and other economic uncertainties).

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Determinants of Domestic Investment:

A Case Study of Middle Income Asian Countries

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Abstract

Investment is a catalyst for economic growth, and the efforts to explore the factors stimulating investment, whether domestic or foreign, public or private, are unstoppable. The present study attempts to investigate empirically, the factors responsible for shaping up domestic investment in the middle income Asian countries. We use a sample of twelve countries and the data extends over a period of 31 years ending at 2010. We employ empirical Bayesian approach for analysis, after undergoing the preliminary testing of data through panel unit root test, redundancy test and panel co-integration. The results suggest that domestic investment is positively determined by lagged investment, real GDP per capita growth, domestic credit to private sector, domestic saving, trade and government expenditures whereas a negative relationship of domestic investment is observed with inflation and interest rate. Findings of the study provide a guideline to the policy makers who intend to boost domestic investment for attaining higher growth rates.

JEL Classification: D9; E2

Key Words: Investment; Economic Growth

1. Introduction

Investment is an important component of aggregate demand in the economy and variations in investment have considerable long term effects on the economic strength of a country. Investment not only enhances the economic growth, but also promotes employment and provides livelihood to masses. The association of investment and long run economic growth is not only emphasized in the era of classical economists, but subsequently a number

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of studies are conducted to empirically test the importance of investment in experiencing higher growth rates (Kuznets (1973), McKinnon (1973), Shaw (1973); Barro and Lee(1994); Collier and Gunning(1999); Ndikumana (2000). All of these studies end up with a conclusion that investment is a strongly associated with economic growth. The investment-growth relationship in general and the Asian financial crises of late 1990's in particular have led to a mob of studies investigating the factors that bring about variations in the rate of investment in developing countries.

Investment, however, can be categorized into two major classes, i.e. foreign direct investment (FDI) and domestic investment (further divided into its public and private parts). There is a flood of studies that attempt to investigate the determinants of foreign direct investment in poor and middle income countries [see for example Juncki and Wunnava (2004); James and Jiangyan (2010); Blonigen and Piger (2011)] However, to explore the factors explaining domestic investment in such countries is relatively less explored area. FDI is subject to considerable costs in terms of increased foreign interference, foreign dependence and flight of capital (in the form of repatriation of profits). Domestic investment, on the other hand is made by the native and more trustworthy, for smooth ongoing of the process of economic development. Although a variety of variables are suggested by various studies conducted elsewhere in the world to be the causing factors of investment in countries. In our study we endeavor to find the determining factors of domestic investment focusing a sample of middle income Asian countries.

Work on investment can be viewed in two distinct dimensions; one set of studies concentrate on analyzing the determinants of Foreign Direct investment (FDI) and another group of studies focused on the determinants of domestic investment. As far determinants of FDI are concerned, lots of studies are available ending up with different covariates of FDI (like Juncki and Wunnava (2004); Blonigen and Piger (2011), For the domestic investment, some other studies that focus on identifying the macroeconomic and financial factor are either narrower in their scope because of considering time series dataonly (Shahbaz et al. (2010); Shah et al. (2012) in Pakistan; Tan and Lean (2010), Tan et al. (2011) in Malaysia; Seruvatu and Jayaraman (2001) in Fiji or directed towards other geographical zones (Salahuddin et al., 2009) in Muslim developing countries). However, the area of middle income countries from Asia is generally ignored and demands attention of the researchers. Determinants of Domestic Investment: A Case Study of Middle Income Asian Countries

The main objectives of our study is to quantify the impact of various indicators on the domestic investment in the middle income Asian countries, various socioeconomic indicators improve by the domestic investment. For example, Unemployment is one of the alarming features of developing economies which lead to poverty and underutilization of the economic resources in such countries. Investment therapy can turn to be the most effective solution to such diseases of unemployment, poverty and underutilization of resources and get an underdeveloped state on the highway of progress and prosperity. It would be useful for the institutions and individuals seeking promotion in the employment and exports, like Ministry of Trade and Manpower and the NGO's engaged in promotion of livelihood and employment.

The remaining part of this study is organized as follows. Section2 contains a review of the relevant literature. Theories of investment and some theoretical underpinnings are given in section3. Section4 explains the econometric model, estimation methodology and description of the data and variables. Empirical results are discussed in section 5 which is followed by the conclusions and policy implications in section 6.

2. Literature Review

In this section we are examining the existing empirical literature focusing the investment and its determining factors. The findings of some of the relevant studies on the topic are discussed below.

The variable that is found significant by the most of empirical studies is lagged investment. Investment practice in the preceding year gives an indication to the investors regarding economic climate in the country and thus, has a potential to affect investment positively. This relationship is observed in many earlier studies based on empirics like Mileva (2008) in transition economies; Salahuddin et al. (2009) in developing countries from the Muslim regions, Donwa and Agbontaen (2010) on Nigeria and Janice et al. (2011)

Another important factor that affects domestic investment is Aggregate demand. An increase in the aggregate demand motivates firms to increase supply and this may require an increase in the installed capacity and thus stimulate investment. Wolf (2002) examines that GDP per capita significantly explains domestic investment, in a positive way, in South African developing countries. Similarly studies by Oshikoya (1994) on African countries, Ghura

and Goodwin (2000) on countries from Asia, find positive relationship between investment and GDP or GDP growth.

Many studies report that investment is positively determined by saving. Bake (2011) and Salahuddin et al. (2009) find in their study that domestic investment is positively related with domestic saving. Mixed results are observed in literature regarding the role of interest rate and inflation in determining investment. Some studies find negative relation with private investment like Frimpong and Marbuah (2010) for Ghana in both short and long run. While, Seruvatu and Jayaraman (2001) find no significant impact of real lending rate on private investment, in Fiji.

A mixed role of inflation is observed, in existing literature, as determinant of domestic investment. Li (2006) finds a negative impact of inflation on domestic investment. Shahbaz et al. (2010) reports a positive impact of inflation on investment reinforcing the theory of Phillips curve. Some studies also end up with a conclusion that inflation has no effect on domestic investment Jaramillo (2010) and Salahuddin et al. (2009).

Investment increases with expansion in the quantum of exports and imports. According to the studies of Frimpong and Marbuah (2010), Salahuddin et al. (2009) domestic investment is positively explained by trade openness. Mileva (2008) in a study on 22 transition economies, however, reports an insignificant impact of trade in the long run.

Since 1980's, a vast literature reveals the importance of financial variables in explaining the behavior of investment. Financial models propose that domestic investment is influenced by the availability of internally generated funds Fazzari et al (1998)), Greenwald et al (1984). Ndikumana (2000) examines a positive relationship between financial development (domestic credit to private sector as a percentage of GDP) and domestic investment in 30 Sub-Saharan countries in Africa. The study also suggests that financial development stimulates economic growth through the channel of capital accumulation.

2.1 Theoretical Background

The way various factors are associated with investment can be viewed as follows. The neo classical approach, on one hand, establishes a negative relationship between the real interest rate and investment due to a push in user's cost of capital, McKinnon and Shaw (1973) on the other suggest that this relationship should be positive, particularly in the developing countries. They argue that investment projects cannot be initiated due to limited access

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to credit and therefore an increase in the real interest rate promotes savings which in turn stimulate investment by bolstering access to capital. Whatever sign the interest rate carries, it is a candidate variable to be included in the model, for testing determining factors of investment.

The growth rate of real output depicts variations in aggregate demand for output which is a matter of concern for the investors and they respond to the higher output growth rates with higher investments (Wai & Wong (1982), Greene and Villanueva (1991). This phenomenon is known as accelerator effect, in the literature and it forms a rationale for the GDP per capita annual growth rate to be incorporated in our model of investment.

The role of government expenditures in shaping up investment can also be postulated on two grounds. First is that it may crowd out domestic investment by escalating interest rate and compressing the volume of funds in the market. On the contrary, it may encourage domestic investment by playing the accelerator wheel. Hence, which of the two roles is dominant in the middle income countries needs to be tested.

High inflation rates not only indicate high degree of uncertainty in the economic environment but it also signals a failure of the government in terms of macroeconomic policy making. In addition, it discourages the financial intermediaries to advance long term funds, thereby further trimming down the investment rate. Thus a negative impact of inflation is assumed in explaining domestic investment.

The volume of international trade or the degree of trade openness can also boost up domestic investment through export and import components. An increase in exports results in the expansion of market for domestic goods and a rising trend of imports, if caused by the purchase of capital goods, leads to higher level of investment. However, if the imports mainly consist of consumer goods, it may discourage domestic products and thus native investors. Trade liberalization may also negative impact on domestic investment due to the increase in risk, as the risk averse investors prefer to invest in financial sector rather than real sector (Demir (2005)),monopoly of satates or private enterprises for any particular product and lack of investment incentives provided by the government (Ouattara (2004)).

Financial development gives rise to better mobilization of savings and then allocation of investment funds to the projects of highest returns. Access of consumers and producers to the financial markets helps to diversify saving and portfolio choices, and increase the opportunities of consumption and income. The variable included for the purpose is the domestic credit available to private sector and it is expected to have a positive impact on domestic investment in our model.

Based on the above mentioned discussion we find a queue of potential variables to be included in our model aimed to highlight significant determinants of domestic investment in the middle income Asian countries.

3. Methodology and Data Description

The present study attempts to explore the determinants of domestic investment in the middle income Asian countries⁴, the countries included in our analysis are Bhutan, China, Fiji, Indonesia, India, Sri Lanka, Malaysia, Pakistan, Philippine, Papua New Guinea, Thailand, and Vanuatu. The sample of Middle income countries is appropriate because Pakistan also falls in this category and mixing various non-homogeneous group may cause heterogeneity problems leading to results not valid for Pakistan. The model employed in our study and a brief description of the variables used is given hereunder.

3.1 Econometric Model

In order to find the role of financial and macroeconomic variable on the domestic investment we use an investment model which is a variant of the model earlier used by Ndikumana (2000). The model in its general form is presented below;

$$INV_{it} = \alpha + \beta INV_{it-1} + \delta X_{it} + u_{it}$$
(4.1)

where INV_{it} is the investment (as a percentage of GDP) of country *i* at time *t*. *X* indicates the set of all possible variables.

As the main objective of our study is to search for the factor explaining domestic investment, therefore we are compelled to include all the possible relevant variables in the model to get unbiased estimators of potential variables of domestic investment. A general model, developed on the basis of existing studies for domestic investment is presented as follows;

$$\begin{split} INV_{it} &= \alpha + \beta_0 INV_{it-1} + \beta_1 Y_{it} + \beta_2 Y_{it-1} + \beta_3 PRIVT_{it} + \beta_4 PRVT_{it-1} + \beta_5 R_{it} + \beta_6 R_{it-1} + \\ \beta_7 S_{it} + \beta_8 S_{it-1} + \beta_9 TRAD_{it} + \beta_{10} TRAD_{it-1} + \beta_{11} GE_{it} + \beta_{12} GE_{it-1} + \beta_{13} D_{it} + \beta_{14} D_{it-1} + \\ \epsilon_{it} \end{split}$$

^(4.2)

⁴The classification is based on the World Bank 2011.

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where;

 INV_{it} = Gross Fixed Capital Formation as a percentage of GDP.

 $PRVT_{it}$ = Domestic credit to private sector as a percentage of GDP

 $Y_{it} = GDP$ per capita growth (Annual %)

 R_{it} = Lending interest rate (%)

 $S_{it} = Gross \text{ domestic savings (% of GDP)}$

 $TRAD_{it} = Trade (\% of GDP)$

 $INF_{it} = Inflation, GDP deflator (annual %)$

 GE_{it} = General government final consumption expenditure (% of GDP)

D_{it} = External Debt (% of GNI)

3.2 Data

Keeping in view the objectives of our study and our specific model, we have obtained data for the middle income Asian countries over the period 1980 to 2010.Non-availability of data on some of the variables induced us to drop some countries from the study and finally we have 12 cross sectional units in our sample. The data is taken from WDI 2011 online data base.

3.3 Methodology

The methodology comprises following: Penal Unit Root, Co-integration test, Redundancy test and the Empirical Bayes Estimation. Classical econometrics is valid only for stationary series and since panel data includes both components, time series as well as cross sections, thus the time series dimension makes it necessary to apply Unit Root test in order to ensure that the results are reliable. Nelson and Plassor (1982) explain that most of the economic series are Unit Root, and as suggested by Engel and Granger (1987), the regression of unit root series is valid only if they are co-integrated. Thus as a first step of estimation process, we have employed unit root test with a view to find whether the series are stationary or not. Series of I (0) are believed to be ideal which mean that there is no unit root, thus signifying that a particular series is stationary at its level. However, if two or more series are found to be non-stationary then the estimated regression yields spurious results [Granger and Newbold (1974)], than co-integration between variables is necessary to be tested.

3.3.1 Panel Unit Root Test

Before we proceed to identify the long run relationship we need to investigate the order of integration in order to verify whether the series is stationary or unit root. A Stationery series is characterized by the constant variance, constant mean and constant covariance of each given lag. For the identification of the order of integration we have used a modern technique of panel unit root developed by Im, Pesaran, Shin (2003) (hereafter referred to as IPS). It specifies a separate ADF regression for every cross section by individual effect and no time trend.

3.3.2 Panel Co-Integration

Finding more than one variable non-stationary urges us to test whether the series are co-integrated. So in the second step of estimation we apply penal co-integration test introduced by Kao (1999) which is Engel-Granger (1987) two step residual based tests to measure the long run relationship among the selected variables.

3.3.3 Redundancy Test

For the purpose of obtaining meaningful results, econometric model should be parsimonious and unimportant variables must be excluded from the model. Where inclusion of insignificant variable enlarges the variability of estimators on one hand, the exclusion of any important variable from the model yields biased estimator on the other. Thus, the process of dropping some variable from the equation is not a hit and trial method but this ought to be done in a systematic manner. Therefore, we have applied coefficient test of redundant variable to obtain a parsimonious model. Test of redundant variables is basically the comparison of the original model and model with redundant variables, in order to decide which variables are to be excluded from the initial equation.

3.3.4 Empirical Bayesian Estimator

Although classical techniques are frequently used in econometrics, Empirical Bayesian is an alternative to such techniques and getting popular due to its advantages as compared with the classical methods. Classical approach ignores the prior knowledge about the parameters and the variability of the parameters. The fact that Bayesian approach incorporates the prior information in the model enhances the power and flexibility of the model and provides results in natural form.
3.3.5 Bayesian Estimation Procedure

It is believed that Empirical Bayesian procedure is efficient over the class of others estimators especially in case of small samples. Bayesian approach has various advantages over the other estimators that lead to more precise and reliable coefficients. It assumes that prior information about unknown must be incorporated in the density function.

$$\hat{\beta}_i / \beta_i \sim N(\beta_i, \wedge_i) \tag{4.4}$$

 $\hat{\beta}_i$ Indicates the estimated elasticities and β_i is true values of elasticity. It shows that 'estimated values' of parameters is normally distributed with mean β_i and variance Λ_i given the true values of parameters. The empirical Bayesian estimators are attained by assuming that β_i is normal prior distribution of the form;

$$[\beta_i | \mu, \Omega] \sim N(\mu, \Omega)$$
(4.5)

Equation 4.5 implies that β_i is normal distribution with μ and Ω . Where, Ω indicates the variance of the prior density which has been calculated from the Ordinary Least Square results that is:

$$\Omega = \left[\sum_{i=1}^{n} \Lambda_{i}^{-1}\right]^{-1}$$
(4.6)

 Ω is the variance of prior density which is simply the weighted average of the variance covariance matrices of the OLS estimates. We follow the procedure of Corrington and Zaman (1994) to calculate the variance covariance matrices of parameters by using the standard errors of OLS estimates obtained in the first stage. μ in equation 4.5 is the mean of prior density which is given below:

$$\mu = \Omega^{-1} \left[\sum_{i=1}^{n} \Lambda_i^{-1} \hat{\beta}_i \right]$$

$$(4.7)$$

 μ is precision weighted average of coefficients of all countries.

Finally the Empirical Bayesian estimator obtained from the posterior density is given as follows:

$$\hat{\beta}^{EB} = V_i \left(\Lambda_i^{-1} \hat{\beta}_i + \Omega^{-1} \mu \right)$$
(4.8)

Formula of Empirical Bayesian is given in equation 4.8. $\hat{\beta}^{EB}$ Means the parameter estimates of the Empirical Bayesian and standard error of the estimates are obtained from 'V_i' which is the variance of the posterior density.

$$V_i = (\Lambda_i^{-1} + \Omega^{-1})^{-1}$$
(4.9)

Estimates of the Bayesian methods are more precise as compared to the classical estimates. Standard errors of the Bayesian are smaller than those of classical which helps in getting more reliable conclusions (Berger (1985)). Some other authors also recommend Empirical Bayesian for the panel data analysis including Koop (1999) and Peseran (2005) whereas a number of researchers have employed Empirical Bayesian approach in their studies Efron and Morris (1972), (Rubin (1981), Hsiao, pesaran and Tahmiscioglu (1999)).

4. Empirical Results

In this study we empirically test the role of financial and macroeconomic variables in the determination of domestic investment, with a view to conclude the debates on the subject.

4.1 Redundancy Test

We estimate equation 4.2, as a first step of formal estimation process, which include lagged investment⁵ and all the variables of financial and macroeconomic nature, in their level and lag forms, which can potentially affect the domestic investment. The model in equation 4.2 is a general model and to get a parsimonious model from model 4.2 we apply the redundancy test to all variables in the model. The findings of this test are given in Table 5.1 below;

| Table 5.1 Results of Exclusive Restriction (Redundancy Test) | | | | | | | | |
|--|--------------|----------|--|--|--|--|--|--|
| Variables | F-statistics | Prob | | | | | | |
| I _{it-1} | 25.34 | 0.000*** | | | | | | |
| Y _{it} | 9.21 | 0.000*** | | | | | | |
| Y _{it-1} | 3.69 | 0.000*** | | | | | | |

⁵Lagged investment is included to control the economic condition in the last year (Li, 2006)

| PRIVT _{it} | 3.47 | 0.000*** |
|-----------------------|-------|----------|
| PRIVT _{it-1} | 1.45 | 0.147 |
| S_{it} | 15.56 | 0.000*** |
| S_{it-1} | 3.51 | 0.000*** |
| TRADE _{it} | 2.81 | 0.002*** |
| TRADE _{it-1} | 2.83 | 0.002*** |
| INF _{it} | 2.13 | 0.018** |
| INF _{it-1} | 4.22 | 0.000*** |
| R _{it} | 3.34 | 0.000*** |
| R _{it-1} | 2.56 | 0.004*** |
| GE _{it} | 2.99 | 0.001*** |
| GE _{it-1} | 2.03 | 0.025** |
| D _{it} | 2.64 | 0.003*** |
| D _{it-1} | 1.32 | 0.210 |

significance at 1% level (***), Significant at 5% level (**)

According to the results of redundancy test, as shown in Table 5.1, we reject the null of redundancy for all the variables except lag of private credit and external debt. The corresponding p-values for rest of the variables indicate the variable is not redundant and hence cannot be excluded from the model.

4.2 Testing Panel Unit Root

Before switching to the formal estimation process we first test unit root of the series of candidate variables in our econometric model. We employ Im, Pesaran and Shin (2003) test for the purpose of finding unit root. The results of the test are given below.

| Table 5.2: Test results of Panel Unit Root (Im, Pesaran and Shin (2003) | | | | | | | | | | |
|---|--------------|----------|------------------|----------|--|--|--|--|--|--|
| | Lev | vels | First Difference | | | | | | | |
| Series | t-statistics | p-value | t-statistics | p-value | | | | | | |
| INV _{it} | -0.252 | 0.401 | -10.209 | 0.000*** | | | | | | |
| Y _{it} | -6.206 | 0.000*** | | | | | | | | |
| PRIVT _{it} | 3.546 | 0.998 | -4.90934 | 0.000*** | | | | | | |
| D _{it} | -0.216 | 0.415 | -5.80144 | 0.000*** | | | | | | |
| GE _{it} | 0.461 | 0.678 | -10.209 | 0.000*** | | | | | | |
| INF _{it} | -4.787 | 0.000*** | | | | | | | | |
| R _{it} | 1.268 | 0.898 | -12.7066 | 0.000*** | | | | | | |
| S _{it} | -0.110 | 0.456 | -10.9317 | 0.000*** | | | | | | |
| TRADE _{it} | 2.195 | 0.986 | -8.78945 | 0.000*** | | | | | | |

Note: *** denote level of significant at 1%

In Table 5.2t-stats and the corresponding p-values for each of the variables show that only two variables (Y_{it}, INF_{it}) are stationary at level. Other series are non-stationary at level, however, these are integrated order one I(1), that is the series become stationary at first difference.

Since more than one variable are non-stationary, we cannot proceed further for the analysis unless we find a long run relationship between the investment and the other variables, that is we are satisfied that there is cointegration between the variables.

4.3 Penal Co-integration

A panel co-integration test introduced by Kao $(1999)^6$ is employed to examine the long run relationship between the variables. Table 5.3 below, yields the output of the test.

| Table 5.3: Test results of Penal Co-integration | | | | | | | | |
|---|--------------|----------|--|--|--|--|--|--|
| с. : | ADF | | | | | | | |
| Series | t-statistics | Prob | | | | | | |
| $\begin{bmatrix} INV_{it}, Y_{it}, PRIVT_{it}, S_{it}, TRADE_{it}, INF_{it}, R_{it}, GE_{it}, D_{it} \end{bmatrix}$ | -4.239 | 0.000*** | | | | | | |

Null Hypothesis: No Co-integration

⁶Kao (1999) test is based on the (Engel Granger (1987) two step residuals.

The results presented in Table 5.3 provide sufficient evidence to reject the null hypothesis of no co-integration, at 1% level. This reveals the existence of a long run relationship between the investment, financial and macroeconomic variables. The fact that the variables are co-integrated allows us to proceed to the estimation process.

4.4 Findings of the Empirical Bayes

Table 5.4 shows the estimates of the empirical Bayes of the investment model. Variables for most of the countries in the table bear expected sign of the estimators are statistically significant. The coefficient of one period lagged investment (hereafter referred to as lagged investment), ranging from 0.59 to 0.66 across countries, shows its positive impact on current investment at 1% level for all cross sectional units. The positive coefficient of lagged investment divulges that investment practice in the previous year acts as an indicator of the economic condition in a particular country, thereby stimulating investment in the following year. Our results are consistent with the findings of Ndikumana (2000) and Salahuddin et al (2009).

The coefficient of GDP per capita growth bears a positive sign and is statistically significant at 1% level for all the countries, with a value ranging from 0.17 to 0.29. It implies that 1% increase in GDP per capita growth has a potential to expand domestic investment by 0.17% to 0.29% in the sample countries. This provides evidence in support of the endogenous growth theory (Locas (1988) and Romer (1986)). The philosophy of neo classical theory of investment that output growth is positively related with the investment due to the accelerator effect⁷, also sustains by this relationship. In terms of quantitative importance, the variable is least important for Papua New Guinea where one percent increases in GDP per capita growth stimulates investment by about 0.17 percent. On the other extreme, one percent change in GDP per capita growth changes domestic investment by 0.29 percent for Malaysia. The results are consistent with the findings of Levine and Rental (1992), Barro and Lee (1994), Ndikumana (2000), Wai and Wong (1982), Fielding (1997), Wolf S. (2002), Mbanga (2002), Akpalu (2002), Greene and Villanueva (1991). Furthermore, it is not only the current level of per capita income that affects domestic investment but its lagged value (one year lag) also determines investment positively (although its quantitative importance is lesser than the variable at level). The variable is significant at 1% and its value stands between 0.07 and 0.11, for the middle income Asian countries.

⁷The accelerator effect theory states Gross Domestic Product (GDP) stimulates investment. In response to a rise in GDP, firms increase their investments and thus the profits go up. Consequently the fixed plode, in the form of increased capital stock. This further leads to economic growth by raising consumer expenditure through the multiplier effect.

| Countrie | | | | | | ~ | a | | - | | | | | <i>a</i> | a. |
|----------------|-----------------|-------------------|-----------------|-------------------|-------------|-----------------|-------------------|-----------------|-------------------|-------------------|---------------------|-----------------|-------------------|-------------|---------|
| S | | I _{it-1} | Y _{it} | Y _{it-1} | P_{it} | S _{it} | S _{it-1} | T _{it} | T _{it-1} | INF _{it} | INF _{it-1} | R _{it} | R _{it-1} | GE_{it} | GE it-1 |
| Bhutan | Coefficien t | 0.63 | 0.2 | 0.1 | 0.04 | 0.2 | -0.06 | 0.01 | -0.04 | -0.02 | -0.05 | 0.02 | -0.15 | 0.13 | -0.03 |
| | t-value | 23.32** * | 9.80*** | 4.56** * | 4.61** * | 8.66*** | - 2.72*** | 1.36 | - 4.73*** | -1.35 | - 3.55*** | 0.48 | - 3.84*** | 2.31** | -0.4 |
| China | Coefficien t | 0.59 | 0.22 | 0.11 | 0.05 | 0.24 | -0.06 | 0.01 | -0.04 | -0.01 | -0.04 | -0.02 | -0.18 | 0.12 | -0.02 |
| | t -value | 22.71** * | 10.70** * | 5.27** * | 5.82** * | 10.14** * | - 2.59*** | 0.83 | - 4.69*** | -0.86 | - 2.84*** | -0.53 | - 4.88*** | 2.15** | -0.24 |
| Fiji | Coefficien t | 0.62 | 0.2 | 0.09 | 0.04 | 0.24 | -0.07 | 0.02 | -0.04 | -0.01 | -0.04 | 0 | -0.16 | 0.14 | -0.06 |
| | t-value | 22.96** * | 9.57*** | 4.05** * | 4.45** * | 10.05** * | - 2.99*** | 1.63 | - 4.56*** | -0.82 | - 3.09*** | 0.05 | - 4.22*** | 2.43** | -0.83 |
| (| Coefficien t | 0.63 | 0.2 | 0.09 | 0.05 | 0.2 | -0.06 | 0.02 | -0.05 | -0.01 | -0.02 | -0.06 | -0.16 | 0.19 | -0.07 |
| Indonesia | t -value | 23.77** * | 9.94*** | 4.23** * | 5.38** * | 8.40*** | - 2.55*** | 1.55 | - 5.16*** | -0.99 | -1.74* | -1.72* | - 4.70*** | 3.18** * | -0.98 |
| | Coefficien t | 0.61 | 0.19 | 0.07 | 0.04 | 0.27 | -0.04 | 0.02 | -0.05 | -0.02 | -0.07 | 0.06 | -0.16 | 0.19 | -0.11 |
| India | t -value | 22.99** * | 10.23** * | 3.56** * | 4.30** * | 12.63** * | -1.91* | 1.98* | - 5.04*** | -1.75* | - 4.94*** | 1.69* | - 4.42*** | 3.47** * | -1.71* |
| a | Coefficien t | 0.62 | 0.21 | 0.11 | 0.04 | 0.21 | -0.06 | 0.02 | -0.05 | -0.02 | -0.05 | 0.01 | -0.12 | 0.13 | -0.06 |
| Sri Lanka | t -value | 22.81** * | 10.15** * | 4.84** * | 4.55** * | 8.65*** | - 2.61*** | 1.71* | - 4.79*** | -1.25 | - 3.32*** | 0.28 | - 3.35*** | 2.23** | -0.89 |
| | Coefficien t | 0.66 | 0.29 | 0.13 | 0.04 | 0.18 | -0.05 | 0.02 | -0.03 | -0.02 | -0.06 | 0.01 | -0.14 | 0.1 | -0.04 |
| M alay sia | t -value | 26.66** * | 14.72** * | 5.96** * | 4.61** * | 7.29*** | -2.08** | 2.17** | - 3.73*** | -1.61 | - 4.58*** | 0.19 | - 3.61*** | 1.64* | -0.54 |
| n the | Coefficien t | 0.63 | 0.19 | 0.11 | 0.04 | 0.22 | -0.06 | 0.02 | -0.04 | 0 | -0.05 | 0.03 | -0.17 | 0.12 | -0.05 |
| Pakistan | t -value | 23.29** * | 9.50*** | 5.18** * | 4.59** * | 9.35*** | - 2.86*** | 1.64* | - 4.58*** | -0.36 | - 3.87*** | 0.76 | - 4.40*** | 2.23** | -0.78 |
| Philippin e | Coefficien t | 0.63 | 0.2 | 0.09 | 0.04 | 0.23 | -0.06 | 0.02 | -0.04 | -0.03 | -0.07 | 0.05 | -0.13 | 0.15 | -0.03 |
| | t -value | 23.02** * | 9.59*** | 4.28** * | 4.71** * | 9.40*** | -2.42** | 1.68* | - 4.36*** | - 2.33** | - 5.23*** | 1.29 | - 3.62*** | 2.46** | -0.51 |
| Papua | Coefficient | 0.65 | 0.17 | 0.09 | 0.04 | 0.21 | -0.08 | 0.02 | -0.04 | -0.02 | -0.06 | 0.02 | -0.11 | 0.15 | -0.05 |
| New Guinea | t-value | 24.17** * | 8.51*** | 4.18** * | 4.63** * | 9.31*** | - 3.38*** | 1.71* | - 4.71*** | -1.13 | - 4.43*** | 0.42 | - 2.92*** | 2.63** * | -0.73 |
| Thailand | Coefficient | 0.64 | 0.23 | 0.11 | 0.03 | 0.19 | -0.03 | 0.01 | -0.03 | -0.02 | -0.05 | 0.05 | -0.17 | 0.16 | -0.04 |
| i nunanu | t-value | 24.10** * | 11.53** * | 5.09** * | 3.20** * | 8.04*** | -1.47 | 0.74 | - 3.80*** | -1.3 | - 3.49*** | 1.34 | - 4.41*** | 2.65** * | -0.63 |
| Vanuatu | Coefficient | 0.61 | 0.22 | 0.11 | 0.05 | 0.19 | -0.06 | 0.01 | -0.05 | -0.02 | -0.05 | 0.02 | -0.15 | 0.15 | 0.05 |
| | t -value | 22.93** * | 10.43** * | 4.93** * | 5.11** * | 8.01*** | -2.40** | 0.98 | - 4.92*** | -1.08 | - 3.53*** | 0.38 | - 4.01*** | 2.65** * | 0.71 |

Table 5.4: Results of Empirical Bayesian Estimation

Significant at 1 % (***), Significant at 5% (**), Significant at 10% (*)

The estimated coefficient of domestic credit to private sector, which is also considered a measure of financial development, is found to have a positive impact on domestic investment. The fact that availability of funds in the credit market promotes investment cannot be undermined despite a small range of the coefficient between 0.03% and 0.05%. Our results are similar to the studies of Stiglitz and Weiss (1981), Greenwald et al. (1984), Islam and Wetzel (1991), Ronge and Kimuyu (1997) and Ghura and Goodwin (2000).

The coefficient of saving is also found to affect the domestic investment positively, for the entire sample and the results are significant at 1% level. India has a coefficient of 0.27, which is highest in the sample whereas Malaysia is on the tail with a value of 0.18. A positive relationship of gross domestic saving with domestic investment implies that the two variables are complimentary; however, a relatively smaller coefficient indicates the higher mobility of capital from these countries. These results are consistent with the findings of Dooley et al. (1987), Wong (1990), Salahuddin and Islam (2008) and Arazmuradov, A. 2011.

We find the coefficient of trade (current level) positive and significant at 5% for Malaysia while for India, Pakistan, Philippine, Sri Lanka and Papua New Guinea, it is significant at 10% level. Its role, however, is not of worth mentioning for rest of the countries in the sample. Positive relationship implies that domestic investment is affected by both exports and imports. Increase in Exports increases the foreign exchange which is necessary for purchase of imported capital goods that is helpful to increase in domestic products. While, the greater access to investment good due to high imports helps to stimulates domestic investment. These results follow the findings of Ghura and Goodwin (2000) and Mileva (2008).

On the other, the estimated coefficient of first lag of trade is negative and significant at 1% level for all the countries ranging between -0.05 and -0.03. This is consistent with the study of Demir (2005) and Ouattara (2005). It advocates that an increase in risk after the trade liberalizations induces risk averse investors to switch investment in financial sector rather than real sector.

The current inflation level does not seem to affect investment significantly, with the exception of India and Philippine where it is significant at 10% and 5% level of significance respectively, and has negatively sign. These findings encompass the studies of Mehrara and Karsalari (2011) and Ghura and Goodwin (2000).

However, the lagged inflation is found to discourage investment (coefficient ranges between -0.02 and -0.07) and the results are significant at one percent level, for all the countries except Indonesia for which the significance stands at 10% level. These results provide evidence in favor of the Fisher's (1993) stand point that inflation curbs investment by raising the risk associated with long-term projects. High rate of inflation indicates poor governance by the government and therefore investors are discouraged. The cost of production is also escalated by high inflation rates which further reduces domestic investment. The results support the findings of Oshikoya (1994), Nazmi (1996), Asante (2002) and Salahuddin M. et al (2009).

The negative sign of estimated coefficients of interest rate advocates the Neo-classical theory of investment that the cost of capital escalates as the interest rate increases, resulting in cuts in the capital expenditures at firms level. For India and Indonesia for which current interest rate is negatively related with investment (at 10% level), the estimator becomes significant in its lag form, at 1% level for all the cross sections. These findings are in line with the results of Green and Villanueva (1991), Serven, and Solimano (1992), Ghura and Goodwin (2000) and Peltonen et al. (2009).

Government expenditures bear a positive coefficient and significant at 1% level for India, Indonesia, Papua New Guinea, Thailand and Vanuatu, at 5% for Bhutan, China, Fiji, Sri Lanka, Pakistan, Philippine and at 10% for Malaysia. With respect to the quantitative important Indonesia and India lead with 0.19% leaving Malaysia farthest behind at 0.10%. The government spending, in our study reveals crowed in effect in contradiction with the study of Ghura and Goodwin (2000). This may be due to the fact that government expenditures in infrastructure (communication, transport and irrigation) and government spending on national defense and security creates a climate favorable for investment as also suggested by Greene and Villanueva (1991).

Although, external debt is believed to be an indicator of macroeconomic uncertainty, it does not constrain domestic investment in the middle income Asian countries and the coefficient is insignificant for the entire sample. One of the reasons behind irrelevance of external debt with that of domestic investment could be the fact that most of the developing countries depend on the loans from official sources at concessional terms rather than from the private sector as suggested by Fitz Gerald et al (1994). Earlier studies of Ghura and Goodwin (2000) also arrive at the similar findings.

In nutshell, the results suggest that lagged investment, real GDP per capita growth, domestic credit to private sector, domestic saving, government

expenditures, lagged of trade, inflation, interest rate are the key determinants of domestic investment in the middle income Asian countries and for the period under study.

5. Conclusion and Summary of the Findings

In this study we attempted to explore the role of various factors in the determination of domestic investment. Our sample consisted of twelve middle income Asian countries and the sample period extended over 31 years ending up to 2010. Empirical Bayesian approach was used for estimation purpose, after undertaking preliminary data testing through the unit root and panel cointegration. We started with a general model of investment incorporating a variety of variables having their candidature on ground of various theoretical considerations. The results of this research are consistent with findings of most of the studies in the existing literature. We found that past outcomes of domestic investment strongly influence the possibility for the investors to reinvest. A positive relationship between growth and investment was also observed implying that increased output is assumed to be an indication of better performance of the economy thereby attracting further investment. Our study also provides evidence in favor of the classical positive relationship between investment and savings. A positive impact of 'availability of domestic credit to private sector' on domestic investment signifies that higher the availability of funds in the credit market, higher would be the rate of investment. Inflation, being an indicator of macroeconomic uncertainty, exhibits cuts in the rate of investment and thus bears a negative relationship with domestic investment. Interest rate is found to affect the domestic investment negatively speaking in favor of the neoclassical approach that the interest rate hurts investment by raising the cost of capital. Furthermore, government expenditures in infrastructure are also found helpful in stimulating domestic investment. The results of this study, thus, highlight the importance of macroeconomic factors and indicators of financial development in determining domestic investment and consequently achieving higher rates of economic growth.

In response to the debates in literature over the potential role of macroeconomic and financial factors in affecting investment, our study arrives at a conclusion that these factors are important in the middle income Asian countries. These findings are helpful in policy formulation and guide the bureaucratic machinery to boost the rate of domestic investment by altering and regulating these variables.

Policies directed towards achieving higher growth rates can also act as a stimulus for capital formation, as growth rate significantly determines investment by improving confidence of the investors. Savings should be promoted to increase investment but it cannot be done via interest channel because an increase in interest rate acts as an impediment to domestic investment. Inflation ought to be contained within reasonable limits, since it is an indicator of uncertainty and higher rates of inflation discourage domestic investment. The factors of financial development also require attention as these financial intermediaries push up levels of investment. A crowd-in effect observed in our study asks government to increase her spending, particularly in the avenues of security and national defense and infrastructure, to attract private investors.

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