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THE ANATOMY OF FINANCIAL CRISIS AND HOW TO PREVENT IT: THE CASE OF DUAL FINANCIAL SYSTEM IN INDONESIA

Ascarya, Widodo Cahyono and Ferry Syarifuddin

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Abstract

Financial crises have occurred one after another, especially since the demise of gold standard regime in 1915 until today with greater frequency, magnitude and area affected, and it has never been resolved. This study aims to determine and examine the root causes of financial crisis from conventional and Islamic perspectives using Structural Equation Modeling (SEM) and Vector Error Correction Model (VECM).

SEM results show that the root causes of financial crisis are structural in the unsustainable FISCAL system (especially, excessive spending and fiscal deficits), unstable MONETARY system (especially, fractional reserve banking and fiat money), poor GOVERNANCE (especially, poor administration and lack of regulation), EXTERNAL factors (especially, business cycle and natural disaster) and BEHAVIOR of economic actors (especially, speculation and individualism).

VECM results show that interest rate and fiat money (unsustainable MONETARY system), volatile food and administered price (poor GOVERNANCE), expectation (BEHAVIOR of economic actors), as well as exchange rate (EXTERNAL factors) and fractional reserve banking (unsustainable MONETARY system) are the main root causes of financial crisis. Meanwhile, profit-and-loss sharing and gold money (just and stable MONETARY system) are the main remedies of financial crisis, which could stabilize the financial system.

JEL Classification: E40, E50, E60, G20

Keywords: Financial crisis, Islamic financial system, Financial stability, Interest, Profit-and-loss sharing (PLS)

I. INTRODUCTION

1.1 Background

Financial crises have occurred one after another since the demise of gold standard regime in 1915. The crises started with depression in Japan (1920), hyper-inflation in Germany (1922-1923), and finally manifested into the great depression in 1929-1930 (Davies and Davies, 1996). Subsequently, financial crisis have hit Austria (banking crisis in 1931), France (hyper-inflation in 1944-1966), Hungary (hyper-inflation and monetary crisis in 1944-1946), German (hyper-inflation in 1945-1946), and Nigeria (banking crisis in 1945-1955).

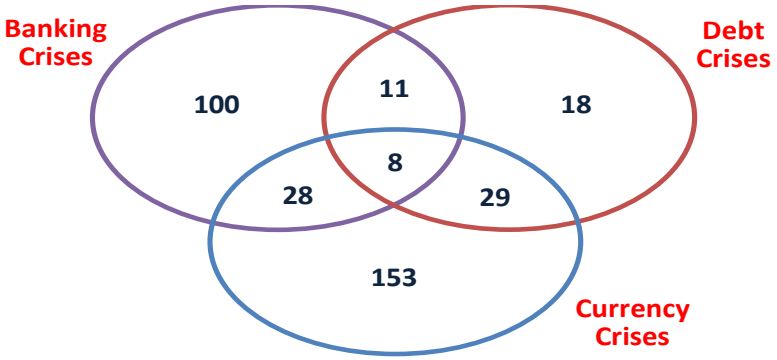
The crises have subsided in the period under Bretton Woods Agreements in 1950-1972, with strict fixed exchange rate international monetary arrangements where US Dollar as world currency is pegged to gold (one troy ounce of gold is equal to 35 US Dollar) while other currencies are pegged to US Dollar, with the guarantee that US Dollar is exchangeable to gold in any time. The Bretton Woods era is known as a golden age, where personal income increases, the volume of world trade increases, investment increases, and international economic stability maintained. David Felix stated that there is no long period of time, in the past or present which is comparable or closely resemble to the achievement (the high production, high productivity, low unemployment, and just distributive income) of Bretton Woods era.

The Bretton Woods agreements finally collapsed in 1971, when the US unilaterally terminated the convertibility of US Dollar to gold. The US enjoyed huge *seigniorage* profits from printing fiat currency without gold back up. Other countries finally followed the US to use fiat money and adopted floating exchange rate. Following the collapse of Bretton Woods Agreements, financial crises have resurfaced more frequently started in England (banking crisis in 1973-74), industrial countries (deep recession in 1978-1980), developing countries (debt crises in 1980-1982), US and UK (great crash of stock exchange in 1987), Mexico (financial crisis in 1994), Asian countries, Russia, Brazil and Argentina (financial crisis and hyper-inflation in 1997-1999).

The latest global economic development was global financial crisis since August 2007 initiated by subprime mortgage crisis in the USA, which has made tens of financial institutions in troubles and some of them have gone bankrupt, such as Lehman Brothers and Bear Sterns in the US, as well as Northern Rock Bank in the UK (Lietaer, *et al.*, 2008). This global financial crisis has been called by leading economists as the worst financial crisis since the Great Depression of the 1930s. Recently, this contagious global financial

crisis has just caused crises in some European countries, such as Greece, Portugal, and Italia.

Since the collapse of Bretton Woods Agreements there have already been 395 financial crises (Laeven and Valencia, 2008) that happened not because of cyclical or managerial failures, but because of structural failures in various countries under very different regulatory systems as well as at different stages of economic development (Lietaer *et al.*, 2008). However, the conventional solutions taken only deal with the symptoms, not the root systemic causes of the crisis. A new database of financial crises in the period of 1970-2011 can be read in Laeven and Valencia (2012) that covers 431 episodes of financial crises including 147 banking crises, 218 currency crises (10 episodes in 2008-2011), and 66 sovereign debt crisis, including 68 twin crises and 8 triplet crises (see figure 1).



Source: Laeven and Valencia (2008), with correction.

Figure 1. The Frequency of World Financial Crises

It seems that they have not learned the lessons yet on how to eradicate and/or control the financial crisis. Even though the crisis has been repeated again and again, none of those countries became economically stronger and more stable. Crisis and financial instability subjects that are so much discussed, but so little understood. Therefore, repeated financial crises and unresolved problems of financial instability have triggered paradigm shifts and posted new challenges on how to stop the crisis and design stable financial system in the future, especially in Indonesia which implementing dual financial system.

1.2 Problem Statement

As the case of inflation, financial crisis and financial instability are subjects that are so much discussed but so little understood so that financial crisis and financial instability have always been repeated and intensified which have caused global economic meltdown

and have made millions of people in less developed, emerging and developed countries suffered. In countries which adopt dual financial system, financial system and its policies could be designed to eradicate and/or minimize financial crisis and to establish sustainable financial stability by maximizing the better characteristics and minimizing the flaws of both conventional and Islamic economic systems to achieve maximum just and distributive human wellbeing.

1.3 Objective

The objective of this study is to determine and examine the root causes of financial crisis from various schools of thought, including conventional and Islamic views to be able to develop stable and crisis proof dual financial system that is directed toward the maximum achievement of just and distributive human wellbeing.

1.4 Methodology

This study will apply qualitative and quantitative methods simultaneously, namely, Structural Equation Modeling (SEM) and Vector Auto Regression (VAR)/Vector Error Correction Model (VECM). Qualitative data will be obtained from field survey to up to 100 knowledgeable respondents, while quantitative data will be monthly time series secondary data of March 2004 to December 2012 obtained from several resources, such as Biro Pusat Statistik (BPS), Indonesian Economic and Finance Statistics of Bank Indonesia (SEKI-BI), Syariah Banking Statistics of Bank Indonesia (SPS-BI), and Ministry of Energy and Mineral Resources (DESDM).

II. LITERATURE REVIEW

2.1 The Theory of Financial Crisis

In general, contemporary economic crisis occurs due to one or a combination of several types of crises, such as banking crisis, exchange rate crisis, sovereign debt crisis, balance of payment crisis, financial crisis, monetary crisis, stock market crash, bubble economy, and hyperinflation. Economic crisis can trigger or triggered by political and social crises. Economic crisis will cause economic contraction that subsequently will lead to stagnation, recession, depression, unemployment, deprivation, starvation, death, as well as other economic, social and political problems and instability.

The most frequently occurred crises are various types of financial crisis, such as banking crisis, exchange rate crisis, and sovereign debt crisis. The underlying theory of financial crisis has been widely discussed in conventional economic literatures, but has not been discussed much in Islamic economic literatures. The next sub-section will discuss the theory of financial crisis under conventional and Islamic economic perspectives.

2.1.1 Financial Crisis under Mainstream Conventional Economic Perspective

The financial crisis can happen in various conditions where several financial institutions or assets loss most of their values. The crisis event can be in the form of financial distress, banking panic or systemic banking crisis, stock market crash, bursting of financial bubble, currency crash, balance of payments distress, sovereign debt default, or a combination of two or more events.

a. Types of Financial Crisis

Types of financial crisis in conventional economic literatures include currency crisis or balance of payments/BOP crisis, banking crisis, sovereign debt crisis, and stock/asset market crash. In reality, financial crisis in a country comprises of two or more types that occur simultaneously or successively.

1. *Currency Crisis* or *BOP Crisis*

   Currency crisis or BOP crisis occurs when the value of a currency depreciates quickly[1], so that undermines its ability to serve as a medium of exchange or a store of value, due to excess demand of foreign currencies (usually in US Dollar or Euro) that cannot

[1] Laeven and Valencia (2008) define currency crisis as a nominal depreciation of the currency of at least 30 percent that is also at least a 10 percent increase in the rate of depreciation compared to the year before.

be satisfied by foreign reserves of the country. If the country adopts fixed exchange regime, the government is forced to devalue its currency and/or to adopt floating exchange regime. The buyers of foreign currency are usually foreign investors who try to flee their assets or capital to safety, which makes country's balance of payments excessively run a deficit. Examples of currency crisis are 1994 Peso crisis in Mexico, 1997 Asian financial crisis (Thailand, Malaysia, Indonesia and Korea), 1998 financial crisis in Russia, and 1999 financial crisis in Brazil and Argentina.

2. *Banking Crisis*

   Banking crisis occurs when a commercial bank suffers a sudden rush of withdrawals (or a bank runs) by many of its depositors. Bank runs can happen since commercial bank operates under fractional reserve banking system, in which bank can make loan more than the deposits received and bank extends loan in long term but receives deposits in short term, so that there is always a mismatch in maturity. Systemic banking crisis happens when bank runs become widespread. If bank runs are not widespread, but the banks are reluctant to extend loan, this situation is called credit crunch. Moreover, in most cases systemic banking crisis is a general realization that systemically important financial institutions are in distress (Laeven and Valencia, 2008). Examples of banking crisis are 1931 banking crisis in the US, 1945-1955 banking crisis in Nigeria, 1973-1974 banking crisis in the UK, 1997-1998 Asian financial crisis, 2007 run on Northern Rock, and 2008 collapse of Bear Stearns.

3. *Sovereign Debt Default*

   Sovereign debt default happens when a country fails to repay its debt to other countries (bilateral debt) or to international institutions (multilateral debt). Sovereign debt default usually follows by debt relief and/or debt restructuring and/or debt rescheduling. Examples of this type of crisis includes 1980 LDCs debt crises, 1980 debt crisis in Poland, and 1982 debt crisis in Mexico (followed by Argentina, Brazil and Venezuela).

4. *Stock/Asset Market Crash*

   Stock/asset market crash happens when overvalued prices of stocks or other financial assets are drop drastically in a short period of time. Overvalued price means that the price of the asset exceeds the values of its future income. Assets are traded with inflated values. In other words there exist price bubbles of assets that inevitably burst. This situation happens when market players choose to seek capital gains rather than dividends, which means that market players are not real investors, but merely speculators. Some examples of this type of crisis are 1929 Wall Street Crash, 1987

stock market crash in the US and the UK, 2008 global stock market crashes in many countries.

Financial crisis is called twin crises when banking crisis and currency crisis happen simultaneously or consecutively, while financial crisis is called triple crisis when banking crisis, currency crisis and sovereign debt crisis happen simultaneously or consecutively (Laeven and Valencia, 2008). Indonesian financial crisis in 1997-1998 was an example of triple crises, which was a combination of currency crisis, banking crisis, stock market crash, followed by sovereign debt default in 1999.

When a financial crisis of one country spreads to other neighboring country (contagion effect), it is called regional financial crisis. When a financial crisis of one country spreads widely to other countries in other part of the world, it is called global financial crisis. This can happen due to integrated and borderless global financial system, so that financial assets movements from one country to another can be done without any barrier. Asian financial crisis in 1997-1998 was an example of regional financial crisis started by the collapse of Thailand Baht followed by the collapse of Malaysian Ringgit, Indonesian Rupiah, the Philippines Peso, and Korean Won. Meanwhile, 2007 subprime mortgage crisis in the US, which has spread out to many developed and developing countries all over the world until today, has been the example of global financial crisis.

Financial crisis erupted in financial sector can be isolated in financial sector and not affected other sector of the economy, such as 1987 stock market crash in the US. However, in many instances, financial crisis is believed to have impact on the decline of economic growth of the country, which means that financial crisis has spread to other sectors, especially the real sector, since banks are unable to extend loan or financing to productive activities. Moreover, aggregate demand declines due to the decline in buying power, unemployment increases due to bankruptcy of businesses, and so on, which at the end financial crisis leads to a wider economic crisis. Prolonged financial crisis not only will slow the economic growth down, but also will cause the economic growth to halt (stagnation). Furthermore, financial crisis can cause recession and even depression. Global financial crisis in 1929-1930 is called the Great Depression since it caused economic depression in many countries in different part of the world. Meanwhile, current on going global financial crisis has caused recession in many countries.

b. Theories of Financial Crisis

The theory of financial crisis under conventional economic perspective mostly views the crisis from macro perspective, which is developed from first generation model,

second generation model, and third generation model. Other alternative theories include world system theory, Minsky's theory, coordination game, herding model and learning model.

First generation model views financial crisis is originated from currency crisis or balance of payments crisis, which is caused by macroeconomic imbalances due to weak economic fundamentals. Under this model, the collapse of fixed exchange regime is due to unsustainable fiscal policy. This model was first proposed by Krugman (1979) and later by Flood and Garber (1984), which incorporate consumer optimization and government's intertemporal budget constraint. Under fixed exchange rate regime the government should set the amount of money supply fixed in accordance with fixed exchange rate. This requirement would severely limit the ability of the government to raise seigniorage revenue from printing fiat money. Therefore, when the government runs persistent primary deficits, it has to use foreign reserves or borrow continuously. In the long run, this is not feasible, so that the government would have to print more money, which would lead to the collapse of fixed exchange regime. This model could not explain Asian financial crisis where despite sound economic fundamentals, these countries still experienced crises.

The second generation model is developed based on the drawbacks of the first generation model and suggests the central role of expectations and coordination failure among creditors, so the crisis could occur independent of soundness of economic fundamentals. This model was first proposed by Obstfeld and Rogoff (1986). When investors have doubts about whether the government is willing to maintain its exchange rate peg, this model generally will exhibit multiple equilibriums, so speculative attacks due to self-fulfilling prophecies may be possible. This means the reason investors attack the currency is that they expect other investors to attack the currency. Ali (2007) mentioned that in the context of a banking crisis it means that irrespective of solvent position of a bank (or of the banking sector as a whole) if a random event can adversely change the collective expectations of the depositors (i.e., its creditors) then it can precipitate a run on the bank and on the banking system. Thus there can be a range of economic fundamentals over which this type of a pure liquidity crisis can occur. These models are deficient from policy perspective in two ways. First, they do not predict why and when crisis may strike because it is based on some random event generating a sudden coordination of expectations. Second, they do not inform us what to do to contain the crisis.

Blanchard (2008) adds that there also exists modern version of bank runs. In traditional bank runs, it was the depositors that took their money out of the banks. In

modern bank runs, troubled financial institutions can no longer finance themselves on money market (short-term wholesale funding). The result is however the same as in the old bank runs: Faced with a decrease in their ability to borrow, institutions have to sell their assets at 'fire sale prices'.

The third generation model is built on the shortcomings of the second generation model by redefining the fundamentals more broadly to include micro incentives and policies. Some other models allow interaction between fundamentals and beliefs so that a crisis is triggered by both factors working together not by any one in isolation (Ali, 2007). The third-generation model emphasizes the balance-sheet effects associated with devaluations. The basic idea is that banks and firms in emerging market countries have explicit currency mismatches on their balance sheets because they borrow in foreign currency and lend in local currency. Banks and firms face credit risk because their income is related to the production of non-traded goods whose price, evaluated in foreign currency, falls after devaluations. Banks and firms are also exposed to liquidity shocks because they finance long-term projects with short-term borrowing (Craig, et al., 2007).

2.1.2 Financial Crisis under Islamic Economic Perspective

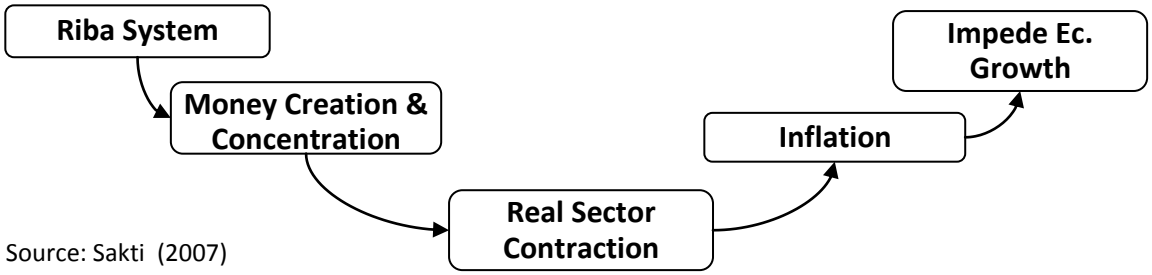
Under Islamic economic perspective, economic crisis could happen when the balance in economic sector and its stakeholders are disrupted due to the transgressions of God's law, especially in the form of riba (interest), maysir (gambling and game of chance or speculation), gharar (excessive uncertainty), price control, manipulation, asymmetric information, distributive justice, fairness, greed, maslahah, etc. in their many forms. Financial sector is a part of economy that supports real sector so that economic activities (especially in production and trade) can run and excel smoothly without any hindrance.

Riba (Interest)

Riba is the central tenet of the system, which literally means "an excess" and interpreted as "any unjustifiable increase of capital whether in loans or sales". More precisely, any positive, fixed, predetermined rate tied to the maturity and the amount of principal (i.e., guaranteed regardless of the performance of the investment) is considered riba and is prohibited. The general consensus among Islamic scholars is that riba covers not only usury but also the charging of "interest" as widely practiced (Iqbal, undated).

Some scholars, like Bernard Lietaer and Tareq el-Diwany, have identified some negative impacts of interest (Meera, 2004), namely: 1) Interest requires endless economic growth even when actual standards of living remain constant; 2) Interest encourages competition among participants in the economy; and 3) Interest concentrates wealth in the hands of

small minority by taxing the majority. Comprehensively, Meera (2004) describes the impact of conventional monetary system that can cause banking crises, economic problems, and political turmoil because money gets destroyed.

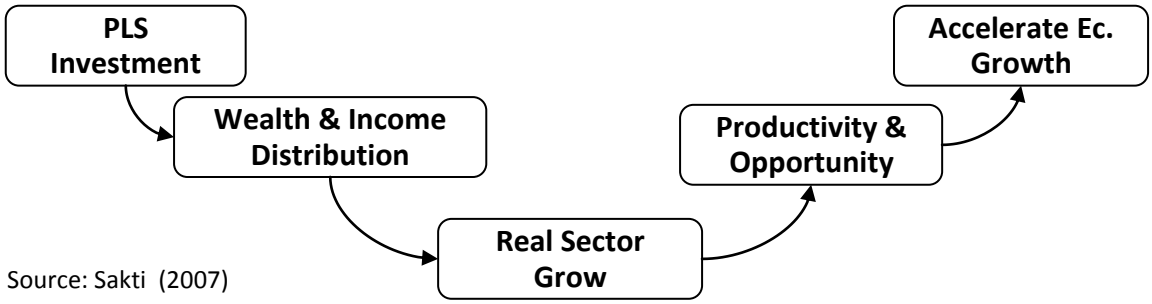


Source: Sakti (2007)

Figure 2. The Implication of Interest in the Economy

In conventional economy, interest (*riba*) system, fiat money, fractional reserve banking system, money as commodity, and the permissibility of speculation cause the creation of money (paper money and bank money) and concentration of money in monetary sector to seek higher return with less or no risk. Consequently, money or investment that should be channeled to the real sector for productive purposes mostly flows to the monetary sector and impedes growth, and even reduces the size of real sector. The creation of money without value addition will cause inflation. In the end, the goal of economic growth will be impeded (read figure 2).

The alternative of interest system in Islamic economic and finance is profit-and-lost sharing (PLS) system. The *zakah* system, PLS system and the prohibition of speculation will accelerate investment activities to the real sector for productive purposes. This will ensure the distribution of wealth and income as well as the growth in the real sector. The improvement in productivity and opportunity to work and to do business finally will accelerate economic growth, and therefore, social wellbeing will be achieved (read figure 3).



Source: Sakti (2007)

Figure 3. The Implication of PLS in the Economy

In modern era, *riba* is not only present in interest, but also present in many other sophisticated forms, such as fiat money, fractional reserve banking, credit card, derivatives, etc.

- *Fiat Money*

Fiat money is something (usually in the form of paper or coin) that is acknowledged as a legal medium of exchange in a certain jurisdiction or state, even though it does not carry a value or back up equivalent to its nominal value. The issuance of fiat money creates a new purchasing power out of nothing. Therefore, fiat money gives unfair benefit, usually known as *seigniorage*, to the money issuer authority. The creation of benefits without any counter value (*'iwad*) in terms of ownership risk (*ghurmi*), value added (*ikhtiyari*), or liability (*daman*) are categorized as *riba* by Ibnu Arabi.

Within economic system where fiat money is used, the institution given the authority to issue money (usually central bank, monetary authority, treasury department, or other appointed institution) gains this *seigniorage* benefit. Consequently, aggregate purchasing power of money will decrease (in the form of inflation) equivalent to the percentage of new money added (issued) in the economy. The party who suffer a loss is the whole population who holds this money. For example, if the cost of printing Rp100,000 bill is Rp2,000, then the *seigniorage* benefit is Rp98,000.

Meanwhile, money in Islam is either full bodied money (money, in the form of gold or silver, which has intrinsic value equivalent to its nominal value) or fully backed money (money, usually in the form of paper or coin, which its nominal value is backed by 100 percent gold equivalent stored by the issuing authority. In this new money issuance, there is no new purchasing power created (no *seigniorage*), so that there is no *riba* involved. Furthermore, in the printing process of new money, the cost of printing is the government responsibility, so that there is no party suffers financial loss.

In the Islamic economic system where Islamic money is used, the institution given the authority to issue money does not gain *seigniorage* benefit; even it has to take the responsibility of printing costs. The amount of money added (issued) to the economy is aligned with the growth of value added of the economy, so that Islamic economic in general does not have inflationary nature and tends to be stable. Therefore, the value of dinar (in gold) and dirham (in silver) have always been relatively stable. For example, the price of sheep has always been around 1-2 dinar, and the price of chicken has always been around one dirham. With this kind of money people do not have to suffer the loss due to a decrease of purchasing power (inflation) like that of fiat money.

The use of fiat money will only benefits big and developed countries, like United States with its dollars and European Union with its Euros, where their currencies are used widely all over the world. With their fiat money, they can suck the wealth of other small and less developed countries that have abundance natural resources and exchange them with paper which has no intrinsic value. For example, with only US$1 expenses to print US$100 bill, the *seigniorage* profit earned by the US from the use of its currency by the world community would be enormous. Whereas, the use of Islamic money would make fair transactions, and all countries are in the same rank. Moreover, Mahmud Abu Saud in his book "Interest Free Banking" (1976) stated that unless we standardized our money and stabilized its value, the sound and healthy economy could not be achieved. Only with the gold (dinar) and silver (dirham) standards that money can be stabilized.

- *Fractional Reserve Banking*

Fractional reserve banking system means that a bank is required to hold reserve in only a certain percentage of deposits mobilized. The minimum reserve requirement of bank varies around 5% - 20%. With this system, bank has the ability to create another kind of fiat money, i.e. bank money (demand deposits, electronic money), through multiple deposit creation. In this case, money is created when a bank extends loan. For example, if the required minimum reserve is 10%, Rp1 million deposit, first, will be recorded as 'Deposit' in liability side and cash 'Reserve' in asset side. Second, since reserve requirement is only 10%, the bank can extend loan as much as Rp9 million, so that the total deposit becomes Rp10 million. This transaction illustrated below.

Balance Sheet 1

Reserve	1 mn	Deposit	1 mn

Balance Sheet 2

Reserve	1 mn	Deposit	1 mn
Loan	9 mn	Deposit (loan)	9 mn

The formula of multiple deposit creation can be written as follows (Meera, 2004):

$$D = 1/r \times R$$

Where, D = change in total deposit; r = minimum reserve ratio (e.g., 10%); and R = change in reserve (e.g., new deposit Rp1 million). In this example, deposit of Rp1 million can create new money (deposit) nine times of its original value, Rp9 million, so that the

total deposit becomes Rp10 million. Therefore, fractional reserve banking system also gives unfair *seigniorage* profit to the bank which authorized to create new bank money. Remember that the creation of profit without any counter value is considered as *riba* by Ibnu Arabi. Consequently, the creation of bank money will also make the aggregate purchasing power of money to decrease (in the form of inflation) equivalent to the percentage of new bank money created by bank. The party who suffer a loss with the creation of new bank money is, again, the whole population who holds this money.

Meanwhile, there are two different deposits under narrow banking system, namely: 1) demand deposits and investment deposits. Bank is required to maintain 100% reserve for demand deposits, while bank could maintain 0% reserve for investment deposits.

Narrow banking system does not give the opportunity for bank to create new (bank) money, since 100 percent reserve (from demand deposits) has to be deposited back to central bank, while bank can only extend loan as much as the original investment deposits. Therefore, there will be no new purchasing power created (and no money multiplication), so that there is no *riba* involved, there is no inflationary effect, and there is no party suffered any loss.

For example, Rp1 million demand deposits will be recorded as 'Demand Deposit' in liability side and cash 'Reserve' in asset side, and bank cannot use this to extend loan/financing. If, later, there is Rp9 million investment deposits (recorder as 'Investment Deposit' in liability side), bank can extend loan/financing as much as Rp9 million, so that in the asset side, there will be 'Financing' of Rp9 million. This transaction can be illustrated below.

Balance Sheet 1

Reserve	1 mn	Demand Deposit	1 mn

Balance Sheet 2

Reserve	1 mn	Demand Deposit	1 mn
Financing	9 mn	Investment Deposit	9 mn

Chapra (2009) states that financial crises are generally caused by excessive and imprudent lending and high leverage by banks due to inadequate market discipline in financial market (with interest system and 'too big to fail' concept) due to lack of self-correcting

mechanisms like what PLS system has. For illustration, the leverage ratios of Lehman Brothers and Goldman Sachs before they went bankrupt were 30 and 26, respectively. Some European banks had even a higher leverage: BNP Parisbas at 32; Dexia and Barclays' leverage ratios are both estimated at about 40; UBS' at 47; and Deutsche Bank's a whopping 83 (Lietaer, 2008).

Maysir (game of chance or speculation)

The *Quran* prohibits contracting under conditions of uncertainty and gambling (*qimar*). The two words, uncertainty and gambling are not synonymous, though related. Uncertainty is same as *gharar* and under such conditions, exchange or contracting is reduced to a gamble. It is interesting to note here that a major objection of contemporary scholars against forwards, futures and options contracts is that these are almost always settled in price differences only. Hence, these are used more as tools of gambling than as tools of risk management (Obaidullah, 2005).

Gambling is prohibited not only because it is a game of chance with irrational speculation and baseless. It is also prohibited because it does not give productive impact to the economy, so that it does not increase aggregate supply of products and services in the real sector. This prohibition is similar to the prohibition of hoarding commodities that will reduce aggregate supply. Therefore, the prohibition of *maysir* economically implies that investment activities should correlate to the real sector to increase aggregate supply.
In modern era, *maysir* is not only present in gambling, but also present in many other sophisticated forms, such as stocks/financial assets trading to make capital gain, forwards, future and options contracts, derivatives products (such as Credit Default Swaps), etc.

Gharar (excessive uncertainty)

According to Obaidullah (2005) *gharar* literally means risk, uncertainty, and hazard, so that the concept of *gharar* broadly defines in two ways, namely: 1) *gharar* implies uncertainty; and 2) *gharar* implies deceit. Iqbal and Mirakhor (2011) also define *gharar* in similar way. *Gharar* stems from information problems (ignorance or lack of knowledge and asymmetric information), intentionally or unintentionally. In the legal terminology of jurists, Ayub (2007) state that *gharar* is the sale of a thing which is not present at hand or the sale of a thing whose consequence is not known or a sale involving hazard in which one does not know whether it will come to be or not, e.g. the sale of a fish in water, or a bird in the air. In one hadits, Ibn 'Abbas narrated that Rasulullah SAW

prohibited *gharar* trading or *bai' al-gharar* (Hadits narrated by Imam ibn Majah, Sunan Ibn Majah vol.3, kitab al-Tijarah, chapter bai' al-gharar, hadits no.2195).

Gharar which comes from uncertainty cannot be avoided altogether in business, so that some degree of *gharar* or uncertainty is acceptable in the Islamic structure of business and finance. Only those transactions that involve too much or excessive uncertainty in respect of the subject matter and the price in a contract should be prohibited (Obaidullah, 2005 and Ayub, 2007). This leaves a problem concerning the extent of uncertainty which make a transaction considered haram and therefore prohibited. Fortunately, scholars have differentiated between Gharar-e-Kathir (too much uncertainty) and Gharar Qalil (nominal uncertainty) and declared that only those transactions that involve too much or excessive uncertainty in respect of the subject matter and the price in a contract should be prohibited (Ayub, 2007).

2.2 The Origin of Financial Crisis

The financial crisis was originated from the debasement of metallic currencies that caused hyper-inflation. Roman gold coins Aureus (7 grams of gold alloyed with silver) and Solidus (4.4 grams, of which 4.2 grams was gold) and Byzantine gold coins were frequently alloyed with other metals of much lower value to create the *seigniorage* necessary for a rational system of government money.

During the Prophet Muhammad's (SAW) time, debasement of currency in all forms was strictly forbidden. The Umayyad ruler Caliph Marwan ibn al-Hakam (65-66 H/684-685 M) had a man's hand cut off for cutting up a *Dirham* or silver currency (Sanusi, 2002).

Meanwhile, English pound that comprised 240 silver pennies in 11th century, by 1666 was being minted into more than 700 pennies at the Royal Mint (El-Diwany, 2002). Later in 14th century, hyper-inflation in Egypt occurred due to overly minted Fulus (copper or bronze) currency by the government. In the time of Sultan Al-Dzahir Barquq (Utsmaniah Empire 781 H), the use of alloyed silver minted by Sultan al-Dzahir Baibras was cancelled and replaced with copper Fulus.

Meanwhile, following its foundation in 1694, Bank of England (BoE) issued 'paper receipts/money' backed by 100 percent gold or silver and fully convertible upon demand. Later on, BoE issued paper money or bank notes on certain reserve ratio, so that paper money supply far exceeded the underlying gold or silver. Consequently, the first two crises of the century in 1825 and 1837 in England were due to over issue of bank notes. In 1254 H Utsmaniah Empire, paper money "al-Qa'imah" was issued and lasted for 23 years. In 1278 H, the circulation of al-Qa'imah was suspended due to too much al-Qa'imah in

circulation. Meanwhile in 1934, the US Dollar was devalued from 23.22 grains of gold to 13.714 grains of gold by order of President Roosevelt (El-Diwani, 2002).

Inspired by the crises in England, David Hume (1711-1766 M) proposed a theory of 'beneficial inflation' with the hypothesis that increasing the money supply would raise production in the short run and may not raise the price at all in the long run. But, John Maynard Keynes (1883-1946 M) was 'the father of inflation' who in 1936 (in his *magnum opus*, The general Theory of Employment, Interest, and Money) successfully developed Hume's idea into formalized model of what the Austrian school called 'inflation economics'. His 'inflation economics', although severely criticized by Austrian school, has been adopted by most today's government all over the world, and has caused repeated financial crises.

Therefore, inflationary and crisis prone economic development paradigm is a deliberate ideological and political choice of 'economic regime' adopted by the government to profit from *seigniorage* income obtained by merely minting undervalued metallic currency or printing valueless paper currency that function as 'legal' tender or money.

Financial Crisis in Previous Era

Financial crises were rarely happened in Islamic era during the time of the Prophet Muhammad (peace and blessing be upon him), the Four Guided Caliphs, Umayyad Empires, Abbasid Empires, and Ottoman Empires. Nonetheless, there have been a few episodes of financial crises during those eras. The most notorious financial crisis was recorded by Al-Maqrizi (766-845 H/1364-1442 M) in 14th century Egypt. The crisis was triggered by overly minted copper currency called *Fulus* by the government of the time. The results were prices of commodities hike to the level of what we called 'hyper-inflation'. This financial crisis has been closely related to the debasement of metallic currency that caused price increase.

Based on this and other events, Al-Maqrizi formulated the causes of the crisis as natural and human error. Natural causes include natural disasters like earthquake, landslide, volcano, typhoon, tornado, floods, tsunami, etc. that would make shortage in the supply of commodities, and subsequently would cause price hike. Economic activities and transactions would be slowed or even halted, which would eventually lead to famine, plague, and death. Moreover, even after the disaster has passed, prices could continue to increase due to previous production halt. As a result, the prices of other products and services would also increase, including salaries and wages.

Human error causes of crisis include corruption and poor management, excessive tax, and too much money in circulation. Note that at this time, there was no interest and no fiat money. However, the most notable cause of crisis was excess money supply due to overly minted metallic currency.

Al-Maqrizi went further to analyze the impact of the crisis to seven groups of society. The first group is power holders or bureaucrats who receive higher nominal income. They are not really affected by the crisis much although their real income and purchasing power drop significantly. The second group is conglomerates or the haves who have high nominal income. They are only affected by the crisis a little due to drop in their assets. The third group is middle entrepreneurs or professionals who have middle to high income. They are almost not impacted by the crisis since their salaries have also increase in line with the price increase. The fourth group is farmers, which can be divided into two groups, i.e., farm owners and farm workers. Farm owners are positively affected by the crisis since their assets increase in value. Farm workers are highly impacted and suffered so much by the crisis since the increase of their income are not in par with the price increase. The fifth group includes Fuqaha (academicians), teachers, students and soldiers who have fixed income. This group is most impacted and suffered by the crisis. The sixth group includes blue collars and servants, while the seventh group includes unfortunates and beggars. These two groups, who have lowest income, are the most suffered by the crisis, so that many of them starve to death.

Another example of financial crisis has happened during the Ottoman Empire in 1839 M. At this time, paper money "al-Qa'imah" was issued as official currency. Later on, the government printed more and more paper money to finance its spending, so that price of commodities increased inevitably which lead to crisis. After 23 years of application, al-Qa'imah finally suspended in 1862 M due to too much al-Qa'imah in circulation to recover from the crisis. The solution taken by the government was right on the root cause of the crisis, so that crisis would not be repeated again in the future.

2.3 Stages of the Recent Global Financial Crisis

As of December 2010, the United State is still in an *economic slump* caused by a *financial crisis* that first manifested itself in August 2007 and ended in early 2009. The primary features of that financial crisis were a *financial shock* in September 2008 and a concomitant financial panic. The financial shock and panic triggered a severe contraction in lending and hiring beginning in the fourth quarter of 2008.

Some observers describe recent economic history as a recession that began in December 2007 and continued until June 2009, and from which we are only now beginning to recover. While this definition of the recession is technically accurate, it obsecures a more important chronology that connects financial market developments with the broader economy. We describe recent U.S macroeconomic history in five stages:

- A series of foreshocks beginning in August 2007, followed by an economist slowdown and then a mild recession through August 2008, as liquidity problems emerged and three large U.S. financial institutions failed;
- A severe financial shock in September 2008, in which ten large financial institutions failed, nearly failed, or changed their institutional structure; triggering
- A financial panic and the beginning of a large contraction in the real economy in the last few months of 2008; followed by
- The end of the financial shock, panic, and rescue at the beginning of 2009; followed by
- A continued and deepening contraction in the real economy and the beginning of the financial recovery and rebuilding period.

As of December 2010, the United States is still in the last stage. The financial system is still recovering and being restructured, and the U.S economy struggles to return to sustained strong growth. The remainder of our comments focuses on the financial crisis in the first three stages by examining its ten essential causes.

The Ten Essential Causes of the Financial and Economic Crisis

The following ten causes, global and domestic, are essential to explaining the financial and economic crisis.

1. **Credit bubble.** Starting in the late 1990s, China, other large developing countries, and the big oil-producing nations built up large capital surpluses. They loaned these saving to the United States and Europe, causing interest rates to fall. Credit spreads narrowed, meaning that the cost of borrowing to finance risky investments declined. A credit bubble formed in the United States and Europe, the most notable manifestation of which was increased investment in high-risk mortgages. U.S. monetary policy may have contributed to the credit bubble but did not cause it.
2. **Housing bubble.** Beginning in the late 1990s and accelerating in the 2000s, there was a large and sustained housing bubble in the United States. The bubble was characterized both by nation increases in house prices well above the historical trend and by rapid regional boom-and-bust cycle in California, Nevada, Arizona, and Florida.

Many factors contributed to the housing bubble, the bursting of which created enormous losses for home-owners and investors.

3. Nontraditional mortgages. Tightening credit spreads, overly optimistic assumptions about U.S. housing price, and flaws in primary and secondary mortgage markets led to poor origination practices and combined to increase the flow of credit to U.S. housing finance. Fueled by cheap credit, firms like Countrywide, Washington Mutual, Ameriquest, and HSBC Finance originated vast numbers of high-risk, nontraditional mortgages that were in some cases deceptive, in many cases confusing, and often beyond borrower's ability to repay. At the same time, many homebuyers and homeowners did not live up to their responsibilities to understand the terms of their mortgages and to make prudent financial decisions. These factors further amplified the housing bubble.
4. Credit rating and securitization. Failures in credit rating and securitization transformed bad mortgages into toxic financial assets. Securitizers lowered the credit quality of the mortgages they securitized. Credit rating agencies erroneously rated mortgage-backed securities and their derivatives as safe investment. Buyers failed to look behind the credit ratings and do their own due diligence. These factors fueled the creation of more bad mortgages.
5. Financial institutions concentrated correlated risk. Managers of many large and midsize financial institutions in the United States amassed enormous concentrations of highly correlated housing risk. Some did this knowingly by betting on rising housing prices, while others paid insufficient attention to the potential risk of carrying large amounts of housing risk on their balance sheets. This enabled large but seemingly manageable mortgage losses to precipitate the collapse of large financial institutions.
6. Leverage and liquidity risk. Managers of these financial firms amplified this concentrated housing risk by holding too little capital relative to the risks they were carrying on their balance sheets. Many placed their firms on a hair trigger by relying heavily on short-term financing in repo and commercial paper markets for their day-to-day liquidity. They placed solvency bets (sometimes unknowingly) that their housing investments were solid, and liquidity bets that overnight money would always be available. Both turned out to be bad bets. In several cases, failed solvency bets triggered liquidity crises, causing some of the largest financial firms to fail or nearly fail. Firms were insufficiently transparent about their housing risk, creating uncertainty in markets that made it difficult for some to access additional capital and liquidity when needed.

7. **Risk of contagion.** The risk of contagion was an essential cause of the crisis. In some cases, the financial system was vulnerable because policymakers were afraid of a large firm's sudden and disorderly failure triggering balance sheet losses in its counterparties. These institutions were deemed too big and interconnected to other firms through counterparty credit risk for policymakers to be willing to allow them to fail suddenly.
8. **Common shock.** In others cases, unrelated financial institutions failed because of a common shock: they made similar failed bets on housing. Unconnected financial firms failed for the same reason and at roughly the same time because they had the same problem: large housing losses. This common shock meant that the problem was broader than a single failed bank – key large financial institutions were undercapitalized because of this common shock.
9. **Financial shock and panic**. In quick succession in September 2008, the failures, near-failures, and restructurings of ten firms triggered a global financial panic. Confidence and trust in the financial system began to evaporate as the health of almost every large and midsize financial institution in the United States and Europe was questioned.
10. **Financial crisis cause economic crisis.** The financial shock and panic caused a severe contraction in the real economy. The shock and panic ended an early 2009. Harm to the real economy continues through today. The financial crisis that has been wreaking havoc in markets in the US and across the world since 2007 had its origins in an asset price bubble that interacted with new kinds of financial innovations that masked risk, with companies that failed to follow their own risk management procedures, and with regulators and supervisors who failed to restrain excessive taking

A bubble formed in the housing markets as home prices across the country increased each year from the mid -1990s to 2006, moving out of line with fundamentals like household income and rents. Expectations of future price increases developed and were a significant factor in inflating house prices. As individuals witnessed rising prices in their neighborhood and across the country, they began to expect them to continue to rise, even in the late years of the bubble when it had nearly peaked. Indeed, the boom in the subprime mortgage market was characterized by several features common to traditional asset price bubbles, such as rapidly rising asset prices, a surge in credit growth, declining risk perceptions, rising risk tolerance, and very high liquidity (Baily, *et al*., 2010).

Many of myths discussed, single out characteristic of subprime loans, subprime borrowers, or the economic circumstances in which those loans were made as the cause of the crisis. All these factors are certainly important for borrowers with subprime mortgages in regard to their ability to keep their homes and make regular mortgage

payments. A borrower with better credit characteristics, a steady job, a loan with low interest rate resets, and a home whose value keeps increasing is much less likely to default on a mortgage than a borrower with everything in reverse (Demyanyk, 2010). But the cause of subprime mortgage crisis and its magnitude were more complicated than mortgage interest rate resets, declining underwriting standards, or declining home values. The crisis had been building for years before showing any signs. It was feeding off the lending, securitization, leveraging, and housing booms

The Crisis in the housing and credit markets demands that one understand what went wrong. Only then can one take the appropriate steps to fix the regulatory apparatus to prevent a similar disruption in the future (or at least contain its severity). Part of went wrong in the mortgage origination process is that originators receive fees without bearing any of the credit risk. Originators could be required to have skin in the game to provide them with incentive to be more selective in the loans they originate. It is clear that origination practices did not always provide adequate information to potential borrowers that would enable them to make informed decisions, especially regarding new products. Some borrowers simply did not understand the terms of their loans. Instead of trying to limit the products financial institutions can offer, however, it may take more sense to concentrate efforts on better informing potential customers about the available customers about the available options and the specific terms of their loans ((Barth, *et al.*, 2010).

2.4 Previous Studies under Conventional Economic Perspective

There are so many papers that discuss financial crisis under conventional perspective, especially after the occurrence of crisis, locally, regionally or globally. Conventional literature that discusses chronology of crisis since the Great Depression is written by Davies and Davies (1996), while the newest database on financial crisis in the period of 1970-2007 is written by Laeven and Valencia (2008), which includes 395 episodes of financial crises (banking crisis, currency crisis and sovereign debt crisis), including 42 twin crises and 10 triple crises. Literatures that discuss Asian financial crisis are plenty, such as Kaminsky and Reinhart (1999), Lindgren *et al.* (1999), McKibbin and Martin (1999), Dooley (2000), Barro (2001), Kawai *et al.* (2001), Caprio and Klingebiel (2002), Allayannis *et al.* (2003), Kaminsky *et al.* (2003), Claessens *et al.* (2004), Eichengreen (2004), Hanson (2005), Goldstein (2005), Caprio (2005), and Caprio *et al.* (2005). There are also several literatures that discuss financial crisis in Indonesia, such as Kenward (2002) and Batunanggar (2002). Moreover, literatures that discuss current global financial crisis triggered by subprime mortgage crisis in the US has also been written by

many authors, such as Caprio *et al.* (2008), Chailloux *et al.* (2008), and Reinhart and Rogoff (2008). Other than those, conventional discussion of the crisis that offers new paradigm is proposed by Lietaer *et al.* (2008).

Summary on important crises of South America, Asia, and other countries can be read in table 1. In general, triple crises are more severe than twin crises or single crisis. It is recorded that triple crises of Chile in 1981 has caused the most output loss. Meanwhile, Ukraine is a country that managed to minimize the loss of triple crises in 1998. Moreover, countries that never hit by the crisis include Australia, Austria, Barbados, Belgium, Belize, Bhutan, Brunei, Canada, Denmark, France, Germany, Hong Kong, Luxemburg, Mauritius, Netherlands, Singapore, and Switzerland.

Table 1. Summary of Important Financial Crises

Country	Year of Crisis	Type of Crisis	NPL (%)	Cost (% GDP)	Loss (% GDP)	Growth Min (%)
South America:						
Argentina	2001	Syst. Banking, Debt, Currency	20.1	9.6	**42.7**	**-10.9**
Bolivia	1994	Syst. Banking	6.2	6.0	0.0	4.4
Brazil	1994	Syst. Banking, Debt R.	16.0	13.2	0.0	2.1
Chile	1981	Syst. Banking, Currency, Debt	35.6	**42.9**	**92.4**	**-13.6**
Colombia	1998	Syst. Banking	4.1	5.0	15.1	0.9
Dominican Rep.	2003	Syst. Banking, Currency, Debt	9.0	**22.0**	15.5	-1.9
Ecuador	1998	Syst. Banking, Currency, Debt	**40.0**	21.7	6.5	-6.3
Mexico	1994	Syst. Banking, Currency	18.9	19.3	4.2	-6.2
Nicaragua	2000	Syst. Banking	12.7	13.6	0.0	0.8
Paraguay	1995	Syst. Banking	8.1	12.9	0.0	0.4
Uruguay	2002	Syst. Banking, Currency, Debt	36.3	20.0	28.8	**-11.0**
Venezuela	1994	Syst. Banking, Currency	24.0	15.0	9.6	-2.3
Asia:						
Indonesia	1997	Syst. Banking, Currency, Debt	32.5	**56.8**	**67.9**	**-13.1**
Korea	1997	Syst. Banking, Currency	**35.0**	31.2	50.1	-6.9
Malaysia	1997	Syst. Banking, Currency	30.0	16.4	50.0	-7.4
Philippines	1997	Syst. Banking, Currency	20.0	13.2	0.0	-0.6
Thailand	1997	Syst. Banking, Currency	33.0	**43.8**	**97.7**	**-10.5**
Vietnam	1997	Syst. Banking, Debt R.	**35.0**	10.0	19.7	4.8
Others:						
China	1998	Syst. Banking	20.0	18.0	**36.8**	7.6
Japan	1997	Syst. Banking	35.0	14.0	17.6	-2.0
Russia	1998	Syst. Banking, Currency, Debt	40.0	6.0	0.0	-5.3
Turkey	2000	Syst. Banking, Currency	27.6	**32.0**	5.4	**-5.7**
Ukraine	1998	Syst. Banking, Currency, Debt	**62.4**	0.0	0.0	-1.9

Source: Laeven dan Valencia (2008)

Meanwhile, the ongoing global financial crisis, started from US subprime mortgage crisis in August 2007 which has spread out to more than 25 countries in various parts of the globe since September 2008, is basically similar to previous financial crises (Reinhart and Rogoff, 2008). At this time of crisis, countries that have never been hit by

financial crisis are unable to avoid the contagion, such as the Netherland, France, Germany, and Singapore.

Studies on current global financial crisis from mainstream economic perspective are plenty. There is an official report from Financial Crisis Inquiry Commission - FCIC (2011) which comprises of 22 chapters divided into five parts, as well as two dissenting views. There is an edited book by Kolb (2011) which comprises of 78 papers grouped in 11 parts. There is one special volume of Cambridge Journal of Economy, volume 33 (2009) which comprises of 15 papers. There is a also CEPR (Centre for Economic Policy Research) publication edited by Felton and Reinhart (2008) which includes 38 papers divided into three parts. Since 2008, there have been more than 100 working papers of IMF and more than 25 working papers of NBER which study global financial crisis and its impacts from many different perspectives.

Moreover, there are countless papers from diverse journals which also discuss ongoing global financial crisis. All of these studies can be classified into three groups, namely: 1) the crisis is caused by short-run symptomatic determinants; 2) the crisis is caused by long-run structural and political economic determinants; and 3) the crisis is caused by fundamental flaws of the economic system.

According to Caprio *et al.* (2008), the principal source of the crisis has been the contradictory political and bureaucratic incentives which undermine the effectiveness of financial regulation and supervision in every country in the world. One of them is financial instrument innovations that lead to more complicated risk shifting behavior, yet less transparent. In fact, there are lessons learned from repeated previous crises. However, they fail to learn from past mistakes. Azis (2008) argues that the root causes of the crisis are global imbalances in current account, investment-savings and export-import. Capital inflow in surplus countries causes asset price bubble which inevitably results in systemic banking crisis.

The current measures to cope with the crisis are still limited to crisis containment and fundamentally have not changed much, such as: a) inject liquidity or bailout; b) lower interest rates; c) fiscal expansion; d) establish asset management institution to buy toxic assets; e) buy share of good asset with cash or securities paper; f) take over ownership and nationalization; g) guarantee interbank loans; h) blanket guarantee or increase deposit insurance; i) temporarily close the bourse; j) prohibit short-selling; k) rely on domestic demand; l) offer incentive to exporter (Azis, 2008; Chailloux et al., 2008; Depkominfo, 2008). Whereas, the program reform to end the crisis are proposed by Caprio et al. (2008): 1) lender reform, where compensation for loan officers must be

linked to long-term performance rather than to short-term profits; 2) Credit Rating Organization (CRO) Reform, that incorporates its agency and accountability; 3) Securitization Reform; 4) Accounting Reform; 5) Improve Government Accountability; 6) Basel II revision to new Basel III since risk management has changed so much.

In the meantime, Lietaer *et al.* (2008) observe the on-going global financial crisis results not from a cyclical or managerial failure, but from a structural one, especially in money and monetary systems. Part of the evidence is repeated financial crises since the breakdown of Bretton Woods agreement with increasing frequency as well as magnitude, and such crashes have happened even under very different regulatory systems as well as at different stages of economic development. Laeven and Valencia (2008) have recorder 395 crises during 1970-2007, including 42 twin crises and 10 triple crises. However, so far the conventional solutions being applied only deal with the symptoms, not the systemic cause, such as bailout, nationalization etc. Similarly, the financial reregulation that will be on everybody's political agenda will, at best, reduce the frequency of such crises, but not avoid their re-occurrence. Their recommendation is the implementation of complementary currency as partial payment of taxes and business-to-business (B2B) which runs in parallel with national currency to increase the availability of money in its prime function as a medium of exchange, rather than for savings or speculation. Additionally, these currencies are expressly designed to link what would remain otherwise unused resources with unmet needs within a community, region or country.

Obstfeld and Rogoff (2009) investigate global imbalances as co-determinant of global financial crisis, besides leverage and housing bubbles. They also argue that financial instability spread globally from the United States, not due to the large and abrupt exchange rate movement, but because of international financial linkages among highly leveraged institutions as well as the global nature of the housing bust. They then propose two agenda of reforms, namely: 1) domestic financial development in the poorer economies. In some emerging-market countries, notably China, high saving is promoted by underdevelopment and inefficiencies in financial markets; and 2) the regulation of internationally integrated financial markets. Now that the fig leaf of constructive ambiguity has been torn away, development of a globally more effective framework for financial regulation is an urgent priority.

Stiglitz (2010) believes that the core problem of financial crisis was bad behavior on the part of the financial system, which almost always behaves badly, where banks and other financial institutions were not stopped from behaving badly by regulators. Some of these factors include flawed individual incentives, flawed corporate governance, flawed

models and intellectual coherence, systemic risk, global imbalances. He counters the argument of too low interest rates for too long period of time by arguing that low interest rates are neither necessary nor sufficient for having a bubble. The solutions he proposes within Keynesian economics include good regulatory system, required government interventions, and financial transaction tax (Tobin's tax).

Mishkin (2010) draws two key lessons from the financial crisis. First, the global financial system is far more interconnected than was previously recognized and excessive risk taking that threatened the collapse of the world financial system was far more pervasive than almost anyone realized. Understanding how systemic risk can arise and designing policies to rein in this risk taking are tasks of the highest priority. Second, extraordinary actions by central banks and governments have contained this global financial crisis, but successfully unwinding these policies will prove to be a highly challenging task.

Claessens, *et al.* (2010) conduct a study to draw lessons and policy implications from the global financial crisis. They argue that the global financial crisis is rooted in a combination of factors common to previous financial crises and some new factors. The commonalities include asset price bubbles, credit booms, marginal loans and systemic risk, as well as regulation and supervision. The new dimensions include: 1) increased opaqueness due to securitization and innovative (but complex) financial instruments, 2) increased financial integration and interconnectedness which increased the risk of transmitting financial shocks across borders; 3) increased leverage (of commercial banks in Europe and of shadow banking system and investment banks in the US); and 4) problems in the households due to over-extension of non-traditional mortgage loans. Moreover, the crisis has brought to light a number of deficiencies in financial regulation and architecture, particularly in the treatment of systemically important financial institutions, the assessments of systemic risks and vulnerabilities, and the resolution of financial institutions. The global nature of the financial crisis has made clear that financially integrated markets, while offering many benefits, can also pose significant risks, with large real economic consequences. They suggest that deep reforms are therefore needed to the international financial architecture to safeguard the stability of an increasingly financially integrated world.

2.5 Previous Studies under Islamic Economic Perspective

Literatures of financial crisis under Islamic perspective are not as plenty as that of conventional perspective, but the studies are increasing. Some literatures on Asian

financial crisis include Hasan (2002) and Hasan (2003) that discuss financial crisis in Malaysia, as well as Garcia *et al.* (2004) that discusses financial crisis in Asia. Meanwhile, Al-Jarhi (2004) analyses banking crisis in Turkey, while Ali (2007) discusses banking crisis in general. Moreover, literatures that discuss current global financial are limited, such as study by Siddiqi (2008) and Chapra (2009). However, literatures in the form of article and short paper are many, such as Harahap (2008), Idris (2008), Iqbal (2008), Izhar (2008), Sakti (2008), Sanrego and Ali (2008), Thomas (2008), and Shodiq (2008).

Newer studies on current global financial crisis from Islamic economic perspective are not as many as those of conventional economic perspective. The Task Force on Islamic Finance and Global Financial Stability, organized by Islamic Development Bank – IDB, published a report on Islamic finance and global financial stability (2010), which discusses the resilience of Islamic finance against global financial crisis. There is one special volume of International Journal of Islamic and Middle Eastern Finance and Management, volume 3 number 4 (2010) which comprises of 8 papers. There is a compilation book by Islamic Economic Research Center, King Abdulaziz University - IERC-KAU (2009), which includes 18 papers of prominent IEF scholars. Moreover, there are also many papers from diverse journals which also discuss ongoing global financial crisis from Islamic perspective.

Summary of literatures on the root causes of financial crises and their alternative solutions under Islamic economic perspective can be read in table 2.

Table 2. Root Causes of Financial Crises And Alternative Solutions

Author	Root Causes	Solutions	
		Short-term	Long-term
Hasan (2002, 2003)	Interest System	Interest-Free System	
	Speculation	Restricted	
	Fractional Reserve Banking	Narrow Banking + Liquidity	
	Fiat Monetary System	Gold Monetary System	
Garcia *et al.* (2004)	Fractional Reserve Banking	Narrow Banking	
	Interest-Based Credit	Equity-Based Financing	
Al-Jarhi (2004)	Fractional Reserve Banking	Narrow Banking	
	Interest-Based Credit	Commodity and PLS Finances	
Ali (2006/2007)	Debt-Based Finance	Equity-Based Finance	
	Weak Internal Mgt		
	Imprudent Financing		
	Poor Crisis Mgt	Crisis Mgt Plan	
	Small Size	Create Association of Islamic Bank	
	Incompetence BODs, Staffs	Competence BODs, Staffs	
	Dual Banking System	Stability of both banks are required	
	Liquidity Access	Easy Access to Liquidity	
	Conv. Bank Products Imitation	IB should not imitate CB products	
Ali (2007)	Macroeconomic factors		
	Ext. Microeconomic factors		
	Int. Microeconomic factors		

Siddiqi (2008)	Moral failure (Greed, Hedonism)	
	Interest System	Interest-free System
	Speculation	Restricted
	Risk Shifting	Risk Sharing
	Money Creation	Restricted
Chapra (2009)	Interest System triggers lack of market discipline and a false sense of assurance against losses: - Excessive lending - Excessive leverage	PLS System Reinvigorate market discipline
	Lack of government finance discipline: - Budget Deficits - Excessive spending, financed by printing money	Fiscal discipline
	Consumerism, perpetuated by easy credit	
	Speculation	Prohibit Speculation
	Fractional Reserve Banking	

Note: **Narrow Banking** = 100 percent reserve for demand deposits and 0 percent reserve for investment deposits. **Macroeconomic factors** include all macro situations. **External microeconomic factors** include supervision problems, inadequate infrastructure, financial liberalization policies, political interference, moral hazard due to deposit insurance, lack of transparency, fraud and corruption. **Internal microeconomic factors** include banking strategy, poor credit assessment, taking interest rate or exchange rate exposure, concentration of lending, entering in new areas of activity, internal control failure, other operational failures.

Al-Masri (2009) believes that the main causes of global financial crisis are: 1) ***ribā*** (interest), which is prohibited by all heavenly revealed religions; 2) **gambling** and ***gharar*** (alea; risk), where gambling is also prohibited by all heavenly religions, so that stock market should be ridded; 3) **derivatives**, since they constitute instruments for gambling and betting, which separate risk from their related assets; 4) **securitization**, which helps increase circulation and price speculation without delivery or receipt of the commodity which remains in its place, and which might even turn into an imaginary or virtual commodity. Securitization has helped separating financial economics from real economics; 5) **trading of debts** (loans) **and money**, which impose interest; 6) **creation of money**, from the practice of fractional reserve banking system, has encouraged the expansion of credit (including credit cards), which has increased risk, so that narrow banking system would be the solution; 7) **slackening control of banks**, which can increase risk and instability; 8) **administrative corruption**, which increases doubtful debt, might lead to bankruptcy and bank runs; 9) **exaggeration of self-interests** over public interests, which leads to exaggeration, fanaticism, extremism and the occurrence of illegitimate and unethical violations; and 10) **misbehaviors of scholars and media**, which withhold information and truth, could lead to catastrophe.

Siddiqi (2008) analyses financial crisis and Islamic economics. He states that the financial crisis started as a credit crunch due to highly over-stretched leverage, was aggravated by the complexity of the products and reached its zenith due to moral failure generating conflicts of interest and mismatch between incentives of the various groups and individuals involved in the saga. The root causes of the crisis include: 1) moral failure that leads to exploitation and corruption, as well as technical flaws and tactical mistakes; 2) *riba* and *maysir* that equates them to bank interest and gambling-like speculation based on risk shifting as distinct from risk sharing; 3) greedy profit-maximizing agents to exploit the aspirations of ordinary investors and for goading home owners and consumers into living beyond their means and chasing untenable dreams; and 4) exaggeration of self-interest over social interest. He suggests Islamic solutions with a world of banking and finance without *riba* and *maysir*. In this new environment risk sharing will replace risk shifting and morality, advising people to be moderate in their material pursuits and considerate about public good in their private decisions, coupled with realism, will serve as the corrective to self- destructive outgrowths of current financial capitalism. Moreover, morality has to be rooted in spirituality.

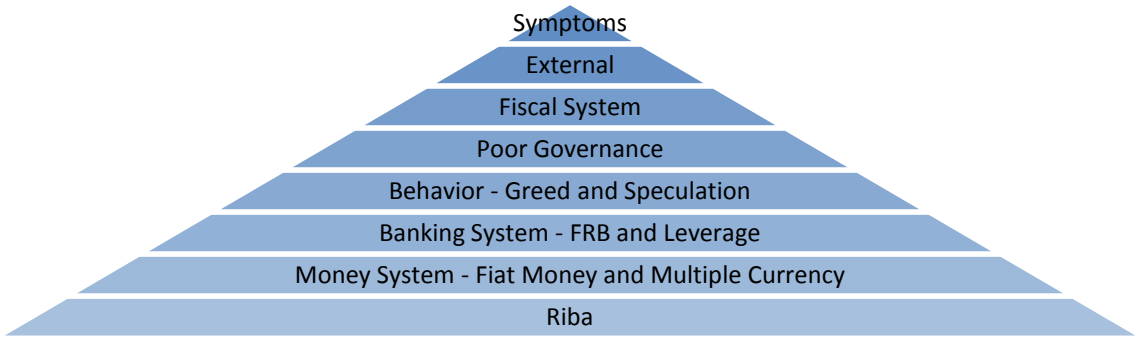
Chapra (2008) studies global financial crisis and tries to examine if Islamic finance can help to alleviate it in the future. He argues that one of the major causes of these crises is the lack of adequate market discipline in the financial system, which leads to excessive lending, high leverage and ultimately the crisis. Unwinding gives rise to a vicious cycle of selling that feeds on itself and leads to a steep decline in asset prices accompanied by bank failures and economic slowdown. He asserts that Islamic finance with risk-sharing along with the availability of credit for primarily the purchase of real goods and services and restrictions on the sale of debt, short sales, excessive uncertainty (*gharar*), and gambling (*qimar*), can help inject greater discipline into the system and, thereby, substantially reduce financial instability.

The root causes of financial crisis from Islamic perspective are: 1) *riba* in its many forms, such as interest system, fiat money, fractional reserve banking system, leverage, and credit card; 2) *maysir* in its many forms, such as speculation in capital market, foreign exchange market, commodity market, and real estate market; 3) *gharar* in its many forms, such as complexity of products, derivatives; 4) poor governance, such as lack of regulation, lack of supervision, lack of control, lack of transparency, corruption, poor administration; 5) misbehaviors of economic actors, such as greed, self interest, speculative behavior, and criminal acts; and 6) external factors, such as international monetary system, business cycle, contagion, and natural disaster.

2.6 Root Causes of Financial Crisis

The mainstream economic paradigms have been criticized on their fundamental flaws that caused global financial crisis always repeat itself in shorter time, larger magnitude and wider destruction. The remedies taken have never touched the root structural causes, but have only touched on the symptoms or surfaces or the tip of the iceberg. Several root structural causes agreed by most non-mainstream economic paradigms include: 1) international money system based on multiple fiat currencies dominated by the US dollar; 2) banking system based on fractional reserves; 3) speculative behavior of economic actors; 4) lack of governance; 5) lack of fiscal discipline; and 6) external causes, including natural causes and the existence of business cycles or credit cycles.

Moreover, according to Islamic economic paradigm, in the heart of these flaws is *riba* (usury or interest) system adopted by any conventional economic paradigms which is inherently unstable and unsustainable. *Riba* not only presents in interest system, but also presents in money creation, credit creation, derivative products innovation and the like. Interest and fiat money systems coupled with speculation activities have caused decoupling of financial/monetary sector and real sector, which has caused bubble in financial sector and contraction in real sector. Therefore, overall causes of financial crisis can be visualized as a pyramid with *riba* on the bottom and symptoms on top (see figure 4).



Source: Author compilation.

Figure 4. Root Causes of Financial Crisis

All of these root causes of financial crisis are manmade or artificial (except natural causes), meaning that they are the results of intentional or accidental human errors, which make economic/financial system deviates from its natural balance and enters into unsustainable economic/financial imbalance. Therefore, they can be corrected to return to

its economic natural balance. Remedies to solve the symptoms will only result in artificial economic balance or financial stability, which is naturally unsustainable.

1. *Riba*

Riba is not only limited to usury or interest. According to Ibnu Arabi, the creation of benefits without any counter value (*'iwad*) in terms of ownership risk (*ghurmi*), value added (*ikhtiyar*), or liability (*daman*) are categorized as *riba* (Rosly, 2005).

Riba literally means "an excess" and interpreted as "any unjustifiable increase of capital whether in loans or sales". More precisely, any positive, fixed, predetermined rate tied to the maturity and the amount of principal (i.e., guaranteed regardless of the performance of the investment) is considered *riba* and is prohibited. The general consensus among Islamic scholars is that *riba* covers not only usury but also the charging of "interest" as widely practiced (Iqbal, undated).

In conventional banking, the predetermined interest has to be paid off by bank to depositor and by borrower to the bank irrespective of the outcome of their businesses. The bank could suffer a loss, but it has to pay off the interest to depositor, while the borrower could also suffer a loss, but he/she has to pay off the interest to the bank. On the contrary, the bank could gain a large profit, but the depositor will still only receive the predetermined interest, while the borrower could also gain a large profit, but the bank will still only receive the predetermined interest. Either way, there is always unfairness.

Interest system could lead to exploitation, predation, and intimidation. Exploitation could happen in time of high interest rates or in time of low interest rates. When the interest rate is high in a bad economic time, the debtor is the one who is exploited by the creditor. Under this circumstance, the debtor business declines and there might be a shrink in profit or even a loss, but the debtor still have to pay high interest. In this bad economic time, predation (where the strong could prey on the weak) and intimidation (where the bank force the debtor to pay the unpaid interest) could happen to the debtor. When the interest rate is low in a good economic time, the creditor is the one who is exploited by the debtor. Under this circumstance, the debtor business is booming and is earning high profit, but the creditor will only receive low interest payment.

Unfairness could happen under the interest system in a good or bad economic time in the form of exploitation, predation, and/or intimidation. These three characteristics are the basic nature of *riba* transactions. Therefore, it will be appropriate to prohibit *riba*, since it will only create inefficiency and instability in the economy. Riba is prohibited in Islamic economic system, while it is also not applied in Binary economic system.

2. Money System

Money essentially is a public good, which fundamentally functions as standard of value, medium of exchange and store of value. Current fiat money is no longer serving as a standard of value. Moreover, current fiat money has also failed to serve as a store of value, since its value is always eroded by inflation.

The issuance of fiat money creates a new purchasing power out of nothing. Therefore, fiat money gives unfair benefit, usually known as *seigniorage*, to the money issuer authority. As mentioned before, the creation of benefits without any counter value is categorized as *riba* by Ibnu Arabi.

Within economic system where fiat money is used, the institution given the authority to issue money (usually central bank, monetary authority, treasury department, or other appointed institution) gains this *seigniorage* benefit. Consequently, aggregate purchasing power of money will decrease (in the form of inflation) equivalent to the percentage of new money added (issued) in the economy. The party who suffer a loss is the whole population who holds this money.

The use of fiat money will only benefits big and developed countries, like United States with its dollars and European Union with its euros, where their currencies are used widely all over the world. With their fiat money, they can suck the wealth of other small and less developed countries that have abundance natural resources and exchange them with paper which has no intrinsic value. Mahmud Abu Saud in his book "Interest Free Banking" (1976) stated that unless we standardized our money and stabilized its value, the sound and healthy economy could not be achieved. Only with the gold (dinar) and silver (dirham) standards that money can be stabilized. Fiat money system is criticized by Islamic economists, Austrian Economists and Binary economists, while it is used in parallel with complimentary currency by Lietaer's Terra system.

3. Banking System

Current banking system based on fractional reserves means that a bank is required to hold reserve in only a certain percentage of deposits mobilized. The minimum reserve requirement of bank varies around 5% - 20%. With this system, bank has the ability to create another kind of fiat money, i.e. bank money (demand deposits, electronic money), through multiple deposit creation. In this case, money is created when a bank extends loan. The formula of multiple deposit creation can be written as follows (Meera, 2004):

$$D = 1/r \times R$$

Where, D = change in total deposit; r = minimum reserve ratio (e.g., 10%); and R = change in reserve (e.g., new deposit Rp1 million). In this example, deposit of Rp1 million

can create new money (deposit) nine times of its original value, Rp9 million, so that the total deposit becomes Rp10 million. Therefore, fractional reserve banking system also gives unfair *seigniorage* profit to the bank which authorized to create new bank money. Remember that the creation of profit without any counter value is considered as *riba* by Ibnu Arabi. Consequently, the creation of bank money will also make the aggregate purchasing power of money to decrease (in the form of inflation) equivalent to the percentage of new bank money created by bank. The party who suffer a loss with the creation of new bank money is, again, the whole population who holds this money. Fractional reserve banking system is criticized by Islamic economists, Austrian economists and Lietaer's view.

4. Speculation

Speculation is a baseless game of chance, like gambling. Speculation does not give productive impact to the economy, so that it does not increase aggregate supply of products and services in the real sector. Speculation in the financial market will inflate prices and create bubbles, which will be burst sooner or later and will end up in financial crisis.

In modern era, speculation is not only present in gambling, but also present in many other sophisticated forms, such as stocks/financial assets trading to make capital gain, forwards, future and options contracts, derivatives products (such as Credit Default Swaps), etc.

Speculation is criticized by almost all mainstream and non-mainstream economists. More specifically, speculation is prohibited in Islamic economic system, which is usually called *maysir*. This prohibition is similar to the prohibition of hoarding commodities that will reduce aggregate supply. Therefore, the prohibition of *maysir* economically implies that investment activities should correlate to the real sector to increase aggregate supply.

5. Governance

Poor governance could cause financial crisis, such as: a) poor administration; b) corruption; c) price control which should not be controlled; d) lack of regulation which should be regulated; and e) lack of disclosure. Stiglitz (2010) mentions that flawed corporate governance is one of the root causes of financial crisis.

6. Fiscal System

Unsustainable and unjust fiscal system could cause financial crisis, especially: a) large and prolong fiscal deficits; b) excessive tax system; c) excessive sovereign external debt; and d) excessive government spending.

7. Business/Credit Cycles

Business cycle or economic cycle in the mainstream economics is an economy-wide fluctuation in economic or productive activities over some period of time (months or years). This fluctuation occurs around a long-term growth trend, and typically involves shifts over time between periods of relatively rapid economic growth (expansion or boom), and periods of relative stagnation or decline or contraction or recession (O'Sullivan and Sheffrin, 2003). This fluctuation is often measured using the growth rate of real gross domestic product (RGDP). Despite being termed cycles, most of these fluctuations in economic activities do not follow a mechanical or predictable periodic pattern.

Business cycle, or preferably called credit cycle by Austrian economists, can be divided into four stages, namely, expansion, crisis, recession and recovery. *Expansion* stage starts when low interest rates tend to stimulate borrowing from the banking system, which causes an expansion of the money supply through the money creation process in a fractional reserve banking system. In this stage production and prices increase. Subsequently, this leads to unsustainable credit-sourced boom during which the artificially stimulated borrowing seeks out diminishing investment opportunities, which results in widespread mal-investments causing capital resources to be misallocated into areas that would not attract investment if the money supply remained stable. *Crisis* stage starts with a correction (or credit crunch or recession or bust) that occurs when exponential credit creation cannot be sustained. The money supply suddenly and sharply contracts. In this stage stock exchanges crash and multiple bankruptcies occur. *Recession* stage follows after the crisis when output and prices drop and interest rates increase. Recovery stage start when markets finally "clear" and causing resources to be reallocated back towards more efficient uses. In this stage stocks recover due to the fall in prices and incomes. Recovery and prosperity are associated with increases in productivity, consumer confidence, aggregate demand and prices.

There are also several other alternative versions of business cycles viewed by different economic paradigms, most notably real business cycle of Chicago School that has been categorically rejected by a number of mainstream economists in the Keynesian tradition.

According to mainstream economists, business cycles after World War II were generally more restrained than the earlier business cycles. Economic stabilization policy using fiscal and monetary policies seemed to have dampened the worst excesses of business cycles. Moreover, there is an automatic stabilization mechanism without

conscious action by policy makers, due to the aspects of the government's budget that helped mitigate the cycle.

Conversely, according to Austrian economists, credit cycle is exacerbated by inherently damaging and ineffective central bank policies, which cause interest rates to remain too low for too long, resulting in excessive credit creation, speculative economic bubbles and lowered savings (Polleit, 2007), and subsequently financial crisis. Therefore, they are against government involvement as only worsening the crisis. The views of different economic school of thoughts on the root causes of repeated global financial crises can be summarized in table 3.

TABLE 3. Views of Economic Paradigms on Global Financial Crisis

	Mainstream Economics	Lietaer's View	Austrian Economics	Binary Economics	CT. Islamic Economics	CL. Islamic Economics
Riba				X	X	X
Money System	X	X	X	X	X	X
Banking System	X	X	X	X	X	X
Speculation	X	X	X	X	X	X
Governance	X	X	X	X	X	X
Fiscal System	X	X	X	X	X	X
Business Cycle	X	X	X	X	X	X

Source: Author compilation.

2.7 Conceptual Framework

The conceptual framework of this study can be seen in figure 5. The anatomy of financial crisis will be viewed from conventional and Islamic perspectives. Conventional perspectives will include: 1) mainstream economics; 2) Austrian economics; 3) Binary economics; and 4) Lietaer's view. Islamic perspectives will include: 1) Classic era (salafus shalih); 2) Abbasiyah era (Abu Yusuf, Abu Ubaid and Al-Ghazali); 3) Utsmaniyah era (Ibn Taimiyah, Ibn Khaldun and Al-Maqrizi); and 4) Contemporary era (modern era). The root causes of financial crisis from all of these perspectives could be categorized into natural causes and man-made causes.

The anatomy of financial crisis will be analyzed using qualitative method structural equation modeling (SEM) and quantitative method vector error correction model (VECM). Following these methods, the root causes of financial crisis will be divided into five groups (latent variables), which include two endogenous (group behavior and external) and three exogenous (governance, monetary system and fiscal system).

The results of quantitative and qualitative analyses will be used as foundation to devise policy recommendations to prevent the crisis.

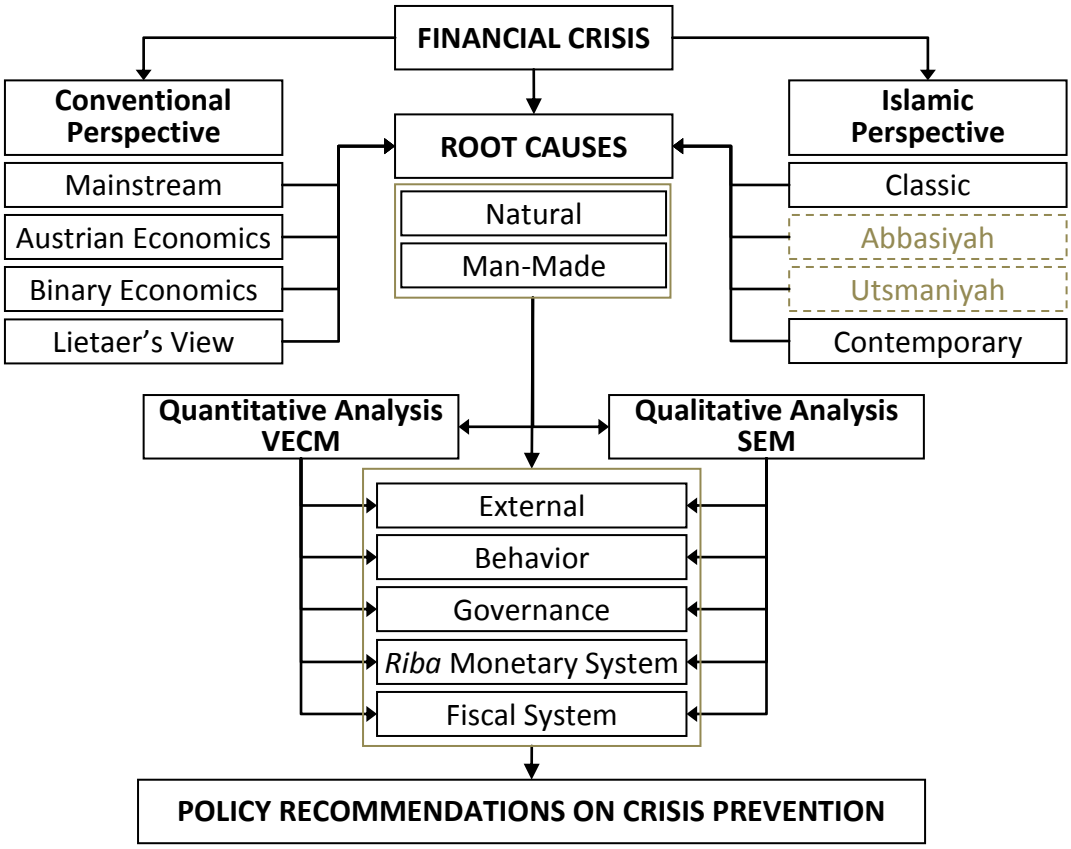


Figure 5. Conceptual Framework

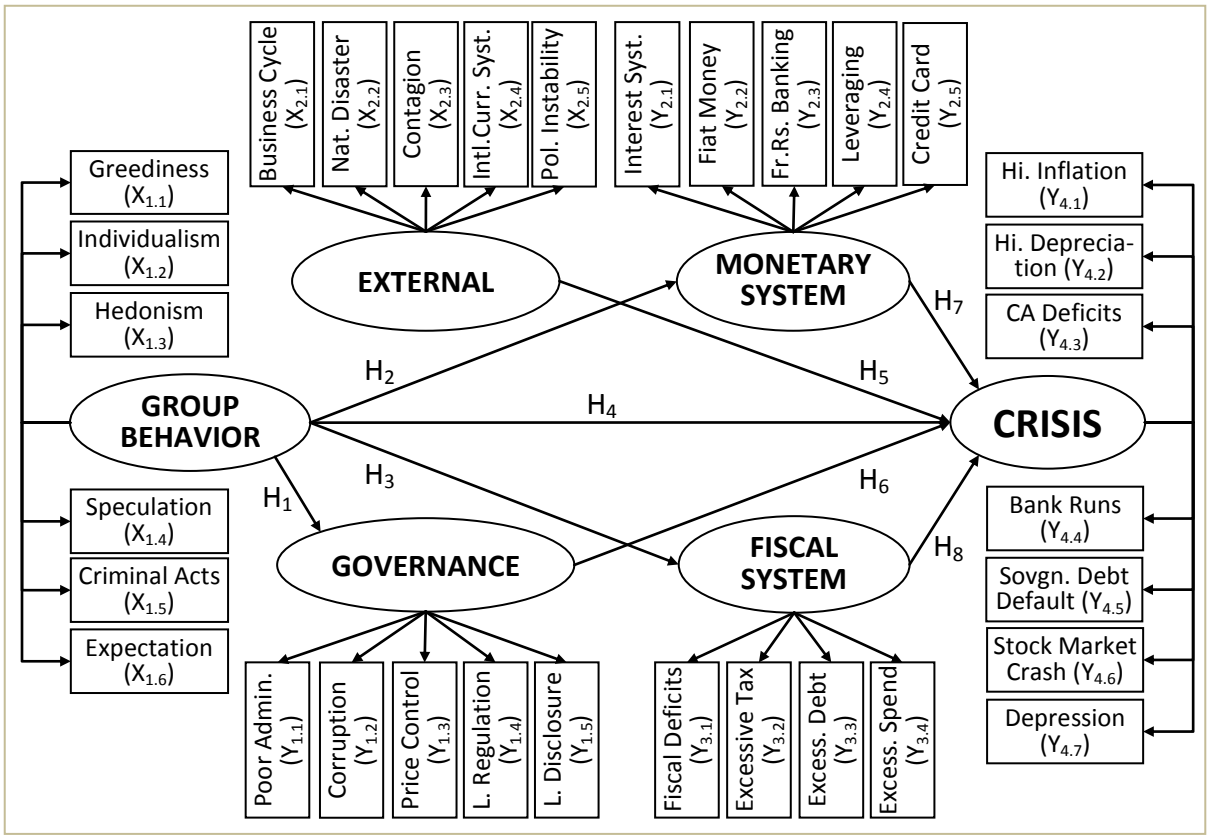


Figure 6. Conceptual Framework

III. METHODOLOGY

3.1 Data

This study will apply qualitative and quantitative methods simultaneously, namely, Structural Equation Modeling (SEM) and Vector Auto Regression (VAR)/Vector Error Correction Model (VECM). Therefore, the data needed include qualitative and quantitative data. Qualitative data will be obtained from field survey to up to 110 knowledgeable respondents using un-probabilistic purposive sampling. Meanwhile, quantitative data will be monthly time series secondary data of March 2004 to June 2012 obtained from several resources, such as Biro Pusat Statistik (BPS), Indonesian Economic and Finance Statistics of Bank Indonesia (SEKI-BI), Syariah Banking Statistics of Bank Indonesia (SPS-BI), and Ministry of Energy and Mineral Resources (DESDM).

3.2 Structural Equation Modeling (SEM)

SEM consists of two main components, namely: 1) structural model, which describes structural relationships among latent variables or unobserved variables or constructs or factors (based on theories) which are measured or estimated indirectly by their respective indicators; and 2) measurement model, which describes indicator variables or measured variables reflecting or measuring or estimating their respective latent variables using the concept of 'Confirmatory Factor Analysis' (CFA) or 'Exploratory Factor Analysis' (EFA). Note that indicator variables cannot be combined arbitrarily to form latent variables. They are selected based on underlying theories.

3.2.1 Structural Model

Stuctural model shows potential direct causal relationships between latent exogenous (usually denoted by ξ 'Ksi') and latent endogenous (usually denoted by η 'Eta') or between two laten endogenous variables which are necessary to understand the real phenomena. Exogenous variables are independents with no prior causal variable(s). Endogenous variables are mediating variables or pure dependent variables. Causal relationship between exonenous variable and endogenous variable is usually depicted by straight line with single headed arrow denoted by γ 'gamma', while causal relationship between two endogenous variables is usually denoted by β 'beta'. Moreover, correlation between two exogenous variables is depicted by curved line with double headed arrow denoted by φ 'Phi', while error in structural equation of endogenous variable is usually

denoted by ζ 'zeta', which shows portion that cannot be explained. Example of structural model can be seen in figure 7.

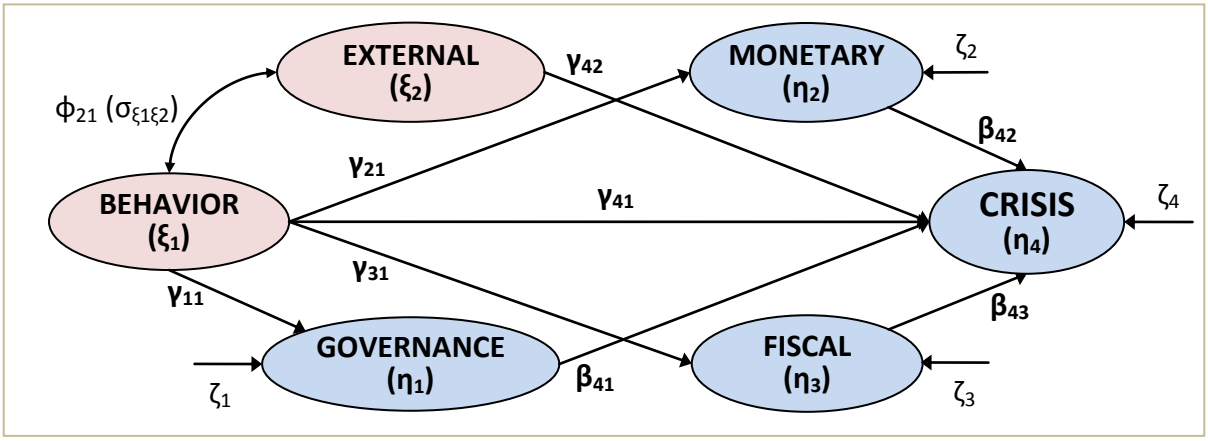


Figure 7. Structural Model of SEM

Structural equations of the above structural SEM model can be written as follows.

$$\eta_1 = \gamma_{11}\,\xi_1 + \zeta_1 \quad (3.1)$$

$$\eta_2 = \gamma_{21}\,\xi_1 + \zeta_2 \quad (3.2)$$

$$\eta_3 = \gamma_{31}\,\xi_1 + \zeta_3 \quad (3.3)$$

$$\eta_4 = \gamma_{41}\,\xi_1 + \gamma_{42}\,\xi_2 + \beta_{41}\,\eta_1 + \beta_{42}\,\eta_2 + \beta_{43}\,\eta_3 + \zeta_4 \quad (3.4)$$

3.2.2 Measurement Model

Measurement model shows causal relationships between laten variable and its indicators or observed/measured variables, which is used to estimate or predict the value of latent variable through several measured variables. Measured varible of exogenous latent variable is usually denoted by X_n, with causal dependency denoted by λ_{Xn} 'lambda' and measurement error δ_n 'delta', while measured variable of endogenous latent variable is usually denoted by Y_n, with causal dependency denoted by λ_{Yn} 'lambda' and measurement error ε_n 'epsilon'. Example of measurement models of the previous latent variables can be seen in figure 8.

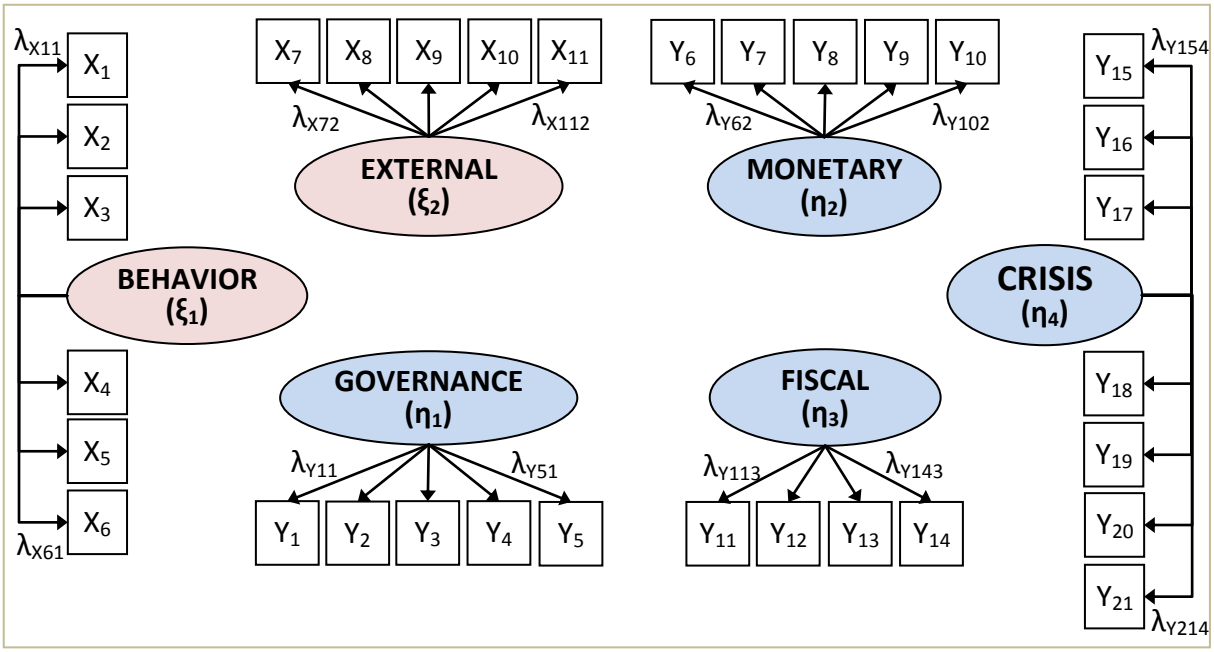


Figure 8. Measurement Model of SEM

Measurement equations of the above measurement SEM model can be written as follows.

- Latent exogenous ξ_1:

  $X_1 = \lambda x_{11}\, \xi_1 + \delta_1$; $X_2 = \lambda x_{21}\, \xi_1 + \delta_2$; $X_3 = \lambda x_{31}\, \xi_1 + \delta_3$; (3.5-3.8)

  $X_4 = \lambda x_{41}\, \xi_1 + \delta_4$; $X_5 = \lambda x_{51}\, \xi_1 + \delta_5$; $X_6 = \lambda x_{61}\, \xi_1 + \delta_6$; (3.9-3.11)

- Latent exogenous ξ_2:

  $X_7 = \lambda x_{72}\, \xi_2 + \delta_7$; $X_8 = \lambda x_{82}\, \xi_2 + \delta_8$; $X_9 = \lambda x_{92}\, \xi_2 + \delta_9$; (3.12-3.14)

  $X_{10} = \lambda x_{102}\, \xi_2 + \delta_{10}$; $X_{11} = \lambda x_{112}\, \xi_2 + \delta_{11}$; (3.15-3.16)

- Latent endogenous η_1:

  $Y_1 = \lambda_{Y11}\, \eta_1 + \varepsilon_1$; $Y_2 = \lambda_{Y21}\, \eta_1 + \varepsilon_2$; $Y_3 = \lambda_{Y31}\, \eta_1 + \varepsilon_3$; (3.17-3.19)

  $Y_4 = \lambda_{Y41}\, \eta_1 + \varepsilon_4$; $Y_5 = \lambda_{Y51}\, \eta_1 + \varepsilon_5$; (3.20-3.21)

- Latent endogenous η_2:

  $Y_6 = \lambda_{Y62}\, \eta_2 + \varepsilon_6$; $Y_7 = \lambda_{Y72}\, \eta_2 + \varepsilon_7$; $Y_8 = \lambda_{Y82}\, \eta_2 + \varepsilon_8$; (3.22-3.24)

$Y_9 = \lambda_{Y92}\,\eta_2 + \varepsilon_9$; $Y_{10} = \lambda_{Y102}\,\eta_2 + \varepsilon_{10}$; (3.25-3.26)

- Latent endogenous η_3:

$Y_{11} = \lambda_{Y113}\,\eta_3 + \varepsilon_{11}$; $Y_{12} = \lambda_{Y123}\,\eta_3 + \varepsilon_{12}$; $Y_{13} = \lambda_{Y133}\,\eta_3 + \varepsilon_{13}$; (3.27-3.29)

$Y_{14} = \lambda_{Y143}\,\eta_3 + \varepsilon_{14}$; (3.30)

- Latent endogenous η_4:

$Y_{15} = \lambda_{Y154}\,\eta_4 + \varepsilon_{15}$; $Y_{16} = \lambda_{Y164}\,\eta_4 + \varepsilon_{16}$; $Y_{17} = \lambda_{Y174}\,\eta_4 + \varepsilon_{17}$; (3.31-3.33)

$Y_{18} = \lambda_{Y184}\,\eta_4 + \varepsilon_{18}$; $Y_{19} = \lambda_{Y194}\,\eta_4 + \varepsilon_{19}$; $Y_{20} = \lambda_{Y204}\,\eta_4 + \varepsilon_{20}$; (3.34-3.36)

$Y_{21} = \lambda_{Y214}\,\eta_4 + \varepsilon_{21}$; (3.37)

3.2.3 SEM Model of the Study

SEM model of this study comprises of two latent exogenous variables, namely Group Behavior ($\boldsymbol{\xi_1}$) and External Events ($\boldsymbol{\xi_2}$), as well as four latent endogenous variables, namely Governance ($\boldsymbol{\eta_1}$), Monetary System ($\boldsymbol{\eta_2}$), Fiscal System ($\boldsymbol{\eta_3}$), and Crisis ($\boldsymbol{\eta_4}$). The corresponding structural equations are exactly similar to equations 3.1 – 3.4.

Meanwhile, the detailed indicators of each latent variable (X_n is indicator of exogenous variable $\boldsymbol{\xi}$ and Y_n is indicator of endogenous variable $\boldsymbol{\eta}$) can be read in Table 4. The corresponding measurement equations are exactly similar to equations 3.5 – 3.37.

Table 4. Indicators of Latent Variables

Group Behavior (X_1)	External Events (X_2)	Monetary System (Y_2)
- X_1: Greediness - X_2: Individualism - X_3: Hedonism - X_4: Speculation - X_5: Criminal Activities* - X_6: Expectation	- X_7: Business Cycle - X_8: Natural Disaster - X_9: Contagion - X_{10}: Intl. Currency System - X_{11}: Political Instability	- Y_6: Interest - Y_7: Fiat Money - Y_8: Fr. Reserve Banking - Y_9: Leverage - Y_{10}: Credit Card
Governance (Y_1)	**Fiscal System (Y_3)**	**FINANCIAL CRISIS (Y_4)**
- Y_1: Poor Administration - Y_2: Corruption - Y_3: Price Volatility/Ctrl. - Y_4: Minimum Control - Y_5: Lack of Disclosure	- Y_{11}: Fiscal Deficits - Y_{12}: Excessive Tax - Y_{13}: Excessive Govt. Debt - Y_{14}: Excessive Spending	- Y_{15}: High Inflation - Y_{16}: High FX Depreciation - Y_{17}: CA Deficits - Y_{18}: Bank Runs - Y_{19}: Sovereign Debt Default - Y_{20}: Stock Market Crash - Y_{21}: Recession/Depression

Note: * Criminal activities: hoarding, fraud, deception, price manipulation (Rab, 2002).

Therefore, the complete SEM model of this study can be illustrated as figure 9. Financial Crisis are caused by Group Behavior, External Events, Governance, Monetary System, and Fiscal System.

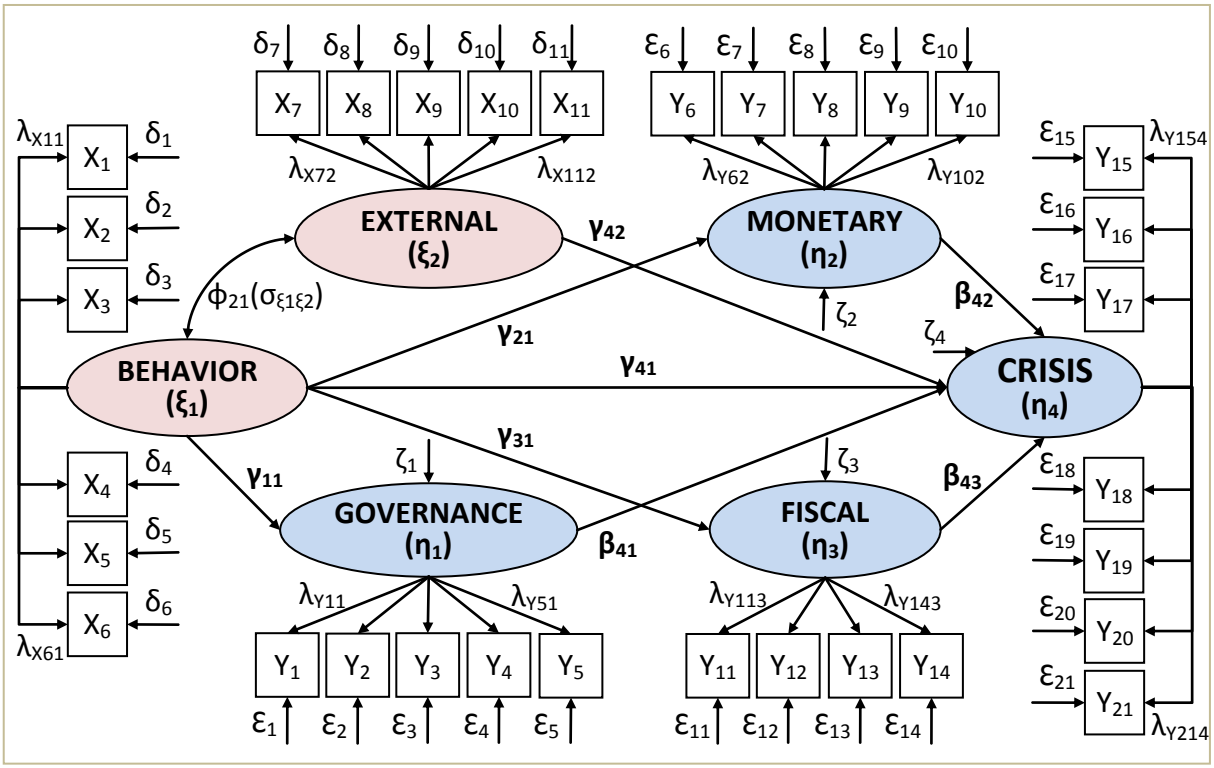


Figure 9. SEM Model of Financial Crisis

3.2.4 SEM Procedure

SEM procedure comprises of several steps, namely: 1) model specification; 2) model identification, 3) Confirmatory Factor Analysis for measurement model (including, programming, estimation, test and modification, as well as re-specification if needed), 4) Path Analysis for structural model (including, programming, estimation, test and modification, as well as re-specification if needed), and 5) interpretation and communication of the results. The summary of SEM procedure can be seen in figure 10.

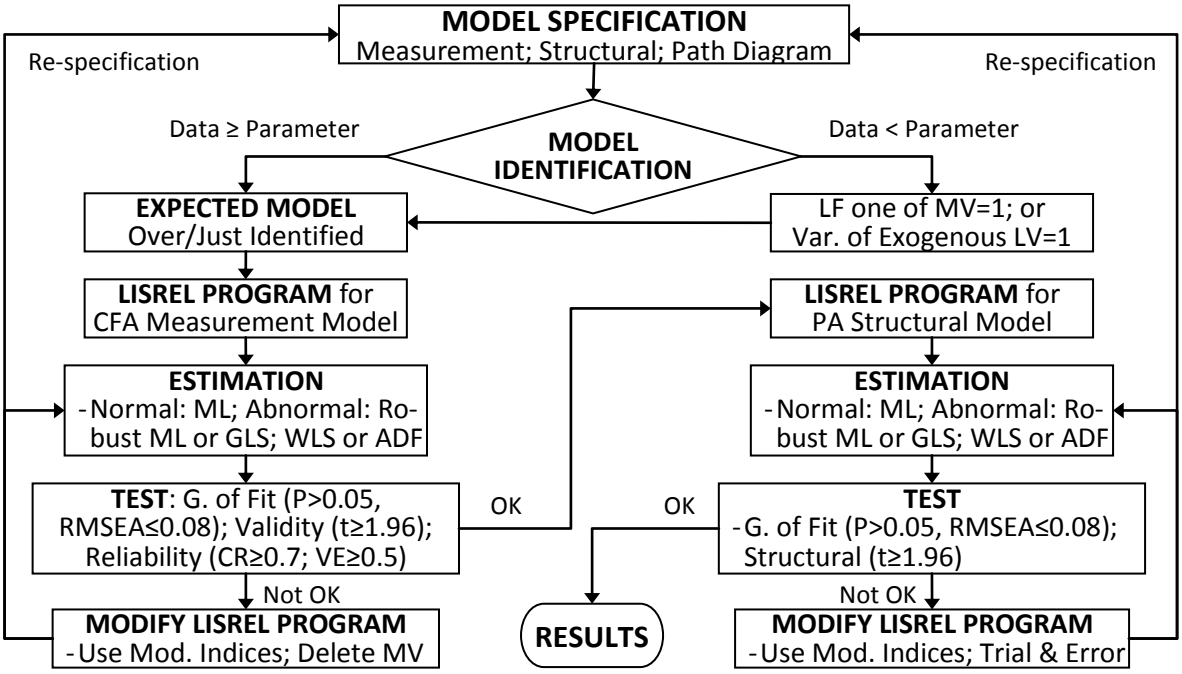


Figure 10. SEM Procedure

Note: LF: *Loading Factor*; SLF: *Standardized Loading Factor*; MV: *Measured Variables*; LV: *Latent Variables*; RMSEA: Root Mean Square Error of Approximation; CR: *Construct Reliability*, CR = $(\sum SLF)^2/((\sum SLF)^2+\sum e_j)$; VE: *Variance Extracted*, VE = $\sum SLF^2/(\sum SLF^2+\sum e_j)$; CFA: *Confirmatory Factor Analysis*; e_j; *measurement error* for each indicator or measured variable, $e_j<0.75$; ML: *Maximum Likelihood*; GLS: *Generalized Least Square*; WLS: *Weighted Least Square*; MI: *Modification Index*; No. of Data = (p+q)*(p+q+1)/2, p = no. of measured variables from all endogenous variables; q = no. of measured variables from all exogenous variables. No. of Parameter = $\beta + \gamma + \lambda_x + \lambda_y + \theta_\delta + \theta_\varepsilon + \zeta + \Phi$.

3.3 Vector Error Correction Model (VECM)

VECM Overview

The second methodology to be used is Vector Auto Regression (VAR), followed by Vector Error Correction Model (VECM), if cointegration occurred. VAR is an *n*-equation with *n*-endogenous variable, where each variable is explained by its own lag, as well as current and past values of other endogenous variables in the model. Therefore, in the context of modern econometrics, VAR is considered as multivariate time series that treats all variables endogenous, since there is no confidence that a variable is actually exogenous, and VAR allows the data to tell what actually happen. Sims (1980) argue that if there is true simultaneity among a set of variables, they should all be treated on an equal footing and there should not be any a priori distinction between endogenous and exogenous variables. Enders (2004) formulates a simple first-order bivariate primitive system that can be written as follows.

$$y_t = b_{10} - b_{12}z_t + \gamma_{11}y_{t-1} + \gamma_{12}z_{t-1} + \varepsilon_{yt} \quad (3.38)$$

$$z_t = b_{20} - b_{21}y_t + \gamma_{21}y_{t-1} + \gamma_{22}z_{t-1} + \varepsilon_{zt} \quad (3.39)$$

With assumptions that both y_t and z_t are stationary, ε_{yt} and ε_{zt} are white noise disturbances with standard deviations of σ_y and σ_z, respectively, and ε_{yt} and ε_{zt} are uncorrelated white-noise disturbances. Meanwhile, the standard form of the above primitive form can be written as follows.

$$y_t = a_{10} + a_{11}y_{t-1} + a_{12}z_{t-1} + e_{yt} \quad (3.40)$$

$$z_t = a_{20} + a_{21}y_{t-1} + a_{22}z_{t-1} + e_{zt} \quad (3.41)$$

Where, e_{yt} and e_{zt} are composites of ε_{yt} and ε_{zt}. The primitive form is called structural VAR, while the standard form is called VAR. The detailed transformation from primitive form to standard form can be read in Enders (2004). In short, according to Achsani *et al*., 2005, the general VAR model mathematically can be represented as follows.

$$x_t = \mu_t + \sum_{i=1}^{k} A_i + X_{t-1} + \varepsilon_t \quad (3.42)$$

Where x_t is a vector of endogenous variables with (n x 1) dimension, μ_t is a vector of exogenous variables, including constant (intercept) and trend, A_i is coefficient matrix with (n x n) dimension, and ε_t is a vector of residuals. In a simple bivariate system y_t and z_t, y_t is affected by current and past value of z_t, while z_t is affected by current and past value of y_t. VAR provides systematic ways to capture dynamic changes in multiple time series, and possess credible and easy to understand approach for describing data, forecasting, structural inference, and policy analysis (Stock and Watson, 2001). VAR provides four tools of analysis, namely, forecasting, impulse response function (IRF), forecast error variance decomposition (FEVD) and Granger causality test. Forecasting can be used to extrapolate current and future values of all variables by utilizing all past information of the variables. IRF can be used to trace current and future responses of each variable to the shock of certain variable. FEVD can be used to predict the contribution of each variable to the shock or changes of certain variable. Meanwhile, Granger causality can be used to determine the causal relationship among variables.

Like any other econometric models, VAR also comprises a series of process of model specification and identification. Model specification includes the selection of variables and their lag length to be used in the model. While, model identification is to identify the equation before it can be used for estimation. There are several possible conditions encountered in the identification process. *Overidentified* condition will be obtained if the number of information exceeds the number of parameter to be estimated. *Exactly identified* or *just identified* condition will be obtained if the number of information

and the number of parameter to be estimated is equal. Meanwhile, *underidentified* condition will be obtained if the number of information is less than the number of parameter to be estimated. Estimation process can only be carried out under *overidentified* and *exactly identified* or *just identified* conditions.

The advantages of VAR method compared to other econometric methods, among others, are (Gujarati, 2004 and Enders, 2004): 1) VAR method is freed from various economic theory restrictions that often exists, such as spurious variable endogeneity and exogeneity; 2) VAR develops model simultaneously within complex multivariate system, so that it can capture all relationships among variables in the equation; 3) Multivariate VAR test can avoid biased parameters due to exclusion of relevant variables; 4) VAR test can detect the relationships among variables within equation system by treating all variables endogenous; 5) VAR method is simple where one does not have to worry about determining which variables are endogenous and which ones exogenous, since VAR treats all variables endogenous; 6) VAR estimation is simple where the usual OLS method can be applied to each equation separately; and 7) The estimate forecasts obtained are in many cases better than those obtained from other more complex simultaneous-equation models.

Meanwhile, the disadvantages and problems of VAR model, according to Gujarati (2004), are: 1) VAR model is a-theoretic, since it uses less prior information, unlike simultaneous-equation model where exclusion and inclusion of certain variables plays a crucial role in the identification of the model; 2) VAR model is less suited for policy analysis, due to its emphasis on forecasting; 3) Choosing the appropriate lag length is the biggest practical challenge in VAR modelling, especially when there are too many variables with long lag-length, so that there will be too many parameters that will consume a lot of degree of freedom and require a large sample size; 4) All variables should be (jointly) stationary. If not, all data should be transformed appropriately, e.g. by first-differencing. Long-term relationships will be lost in the transformation of data level needed in the analysis; and 5) Impulse Response function (IRF) is the centrepiece of VAR analysis, which has been questioned by researchers.

To overcome the drawback of first difference VAR and to regain the long-term relationships among variables, vector error correction model (VECM) can be applied, provided that there are cointegrations among variables. The trick is to reincorporate original equation in level into the new equation as follows.

$$\Delta y_t = b_{10} + b_{11}\Delta y_{t-1} + b_{12}\Delta z_{t-1} - \lambda\left(y_{t-1} - a_{10} - a_{11}y_{t-2} - a_{12}z_{t-1}\right) + \varepsilon_{yt} \qquad (3.43)$$

$$\Delta z_t = b_{20} + b_{21}\Delta y_{t-1} + b_{22}\Delta z_{t-1} - \lambda\left(z_{t-1} - a_{20} - a_{21}y_{t-1} - a_{22}z_{t-2}\right) + \varepsilon_{zt} \quad (3.44)$$

Where *a* is long-term regression coefficient, *b* is short-term regression coefficient, λ is an error correction parameter, and the frase in the bracket shows the cointegration between variables *y* and *z*. The general VECM model mathematically can be represented as follows (Achsani *et al*, 2005).

$$\Delta x_t = \mu_t + \prod x_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta x_{t-i} + \varepsilon_t \quad (3.45)$$

Where, Π and Γ are functions of A_i. The matrix Π can be decomposed into two matrices λ dan β with (*n* x *r*) dimension. $\Pi = \lambda\beta^T$, where λ is called an adjustment matrix and β is a cointegration vector. Moreover, *r* is a cointegration rank.

VECM Procedure

VAR/VECM analysis process can be read on figure 11. After basic data is ready, data is transformed into natural logarithm form (ln), except for interest rates and the PLS return, to obtain consistent and valid results. The first test conducted was the unit root test, to find out whether data is stationary or still contain trends. If the data are stationary at levels, then VAR can be conducted at level. VAR level can estimate the long-term relationship between variables. If data are not stationary at level, then the data should be reduced at the first level (first difference), which reflects the difference or changes in data. If the data are stationary at first difference, then the data will be tested whether there is cointegration between variables. If there is no cointegration between variables, then VAR can only be done at the first difference, and it can only estimate the short-term relationship between variables. Innovation accounting would not be meaningful for the long-term relationship between variables. If there is cointegration between variables, then VECM can be done using data level to obtain long-term relationship between variables. VECM can estimate the short-term and long term relationship between variables. Innovation accounting for the level VAR and VECM will be meaningful for the long-term relationships.

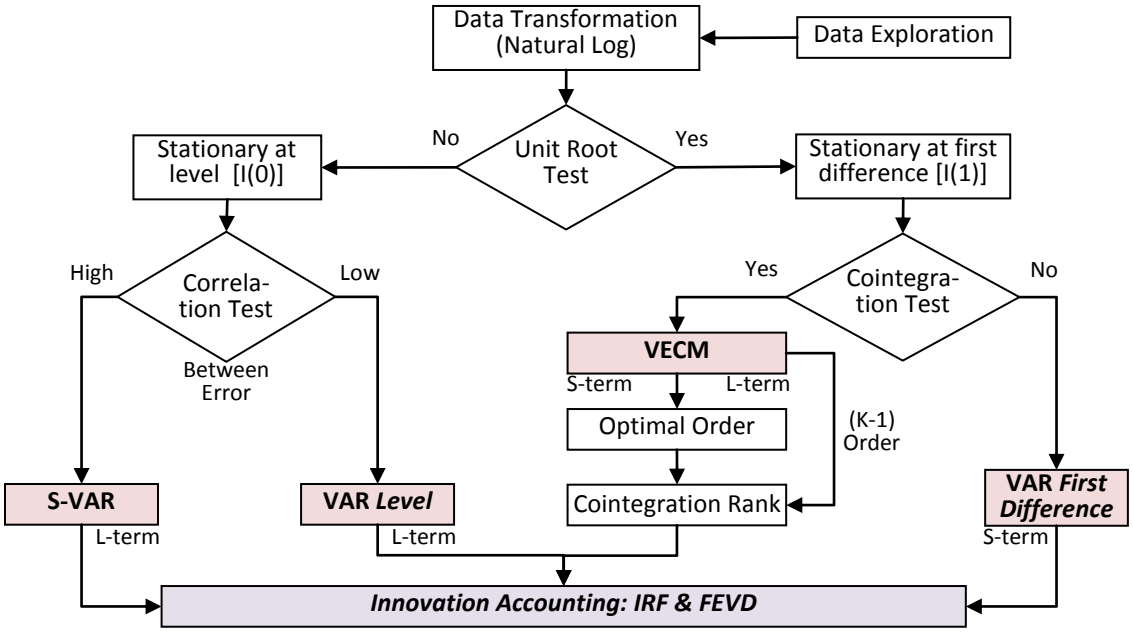


Figure 11. VAR Analysis Process

VECM Model

The general model of VECM can be expressed as equation (3.45).

$$\Delta x_t = \mu_t + \prod x_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta x_{t-i} + \varepsilon_t$$

Where:

x_k is k selected endogenous variables, specific for each model;

ε_k is disturbance or error term with zero means and constant variance-covariance.

Conventional Crisis model:

x_k = [Crisis, Riba, Money Creation, Speculation, Governance, Behavior]

Islamic Crisis model:

x_k = [Crisis, no-Riba, no-Money Creation, no-Speculation, Governance, Behavior]

Tentative proxies for selected endogenous variables (conventional and Islamic) can be seen in table 5 as follows:

Table 5. Proxies of Endogenous Variables

Model	Crisis	Riba	Money	Speculation	Governance	Behavior
Conventional	- CPI; - GDP;	Interest Rate	- Fiat Money (M_0); - FRB (M_2-M_0); - Exch. Rate	Allowed	- Volatile Food; - Administered	Expectation
Islamic	- CPI; - GDP;	PLS	- Just Money (M_1); - Gold	Prohibited	- Stable Food; - Non-Adm.	Non-Exp.

The focus of differentiation between conventional and Islamic crisis models will be in the area of riba and money, so that the dual crisis models (inflation and growth) are as follows:

- INF = *f* (INT, PLS, FM, FRB, IM, EXCH, GOLD, VF, ADM, XINF) (3.46)
- GRO = *f* (INT, PLS, FM, FRB, IM, EXCH, GOLD, VF, ADM, XINF) (3.47)

Where:

- INF: the index of monthly CPI (consumer price index) inflation obtained from table "Indeks Harga Konsumen dan Inflasi Bulanan Indonesia", BPS.
- GRO: the index of monthly IPI (industrial production index) obtained from table "Indeks Produksi Bulanan Industri Besar dan Sedang, 2003-2011", BPS.
- INT: the rate of one-month conventional time deposits, obtained from table I.28 "Suku bunga simpanan berjangka rupiah menurut kelompok bank": Bank Umum 1/3/6/12/24 bulan, SEKI-BI.
- PLS: the rate of one-month Islamic time deposits (deposito iB), obtained from table 36 "Ekuivalen Tingkat Imbalan bagi hasil/fee/bonus – Bank Umum Syariah dan Unit Usaha Syariah": Time Deposits – 1 month, SPS-BI.
- FM: money creation originally issued by the central bank or money in circulation (M0), obtained from table I.2 "Neraca analitis otoritas moneter": Uang Kartal yang diedarkan, SEKI-BI.
- FRB: credit creation or fractional reserve banking, is the difference between broad money M2 and M0 monthly. Broad money M2, obtained from table I.1 "Uang Beredar dan Faktor-Faktor yang Mempengaruhinya": M2, SEKI-BI.
- IM: Just money supply or money needed in the economy in Islamic perspective, which is an equilibrium intrinsic M0 proximate by the monthly M1 and GDP data obtained from SEKI-BI and BPS.
- EXCH: Multiple currency system or exchange rate, is the nominal Rupiah exchange rate to the US Dollar obtained from SEKI-BI.
- GOLD: Single global currency or gold price, is international gold price index obtained from "Indeks Harga Energi", SEKI-BI.
- VF: Volatile food inflation, is monthly food price index for rice obtained from SEKI-BI.
- ADM: Administered price, is monthly gasoline (premium) price obtained from Ministry of Energy and Mineral Resources (KESDM).
- XINF: Expected inflation, is the rate of monthly inflation, CPI index, of previous period obtained from table "Indeks Harga Konsumen dan Inflasi Bulanan Indonesia", BPS.

IV. RESULTS AND ANALYSIS

4.1 SEM Results

The SEM results presented in this section are the final process of several SEM procedure started from specification, identification, estimation, testing, and final results. The complete results of all SEM procedures can be obtained from the authors.

4.1.1 Measurement Model

The results of six measurement models comprise of two exogenous latent variables (BEHAVIOR and EXTERNAL) and four endogenous latent variables (GOVERNANCE, MONETARY, FISCAL and CRISIS) will be discussed.

a. BEHAVIOR

Measurement model of latent exogenous variable BEHAVIOR satisfies three main conditions, namely, χ^2/df ≤ 3.0 (1.42/5), P > 0.050 (0.92) and RMSEA ≤ 0.08 (0.00). All goodness of fit (GoF) measures is fit, so that we may conclude that measurement model of BEHAVIOR is a good model with close fit (AGFI = 0.98).

All measured indicator variables (X_1 – X_6) are significantly caused by BEHAVIOR. Speculation (X_4) and Individualism (X_2) have the highest loading factors (0.86), followed by Hedonism (X_3) and Greediness (X_1).

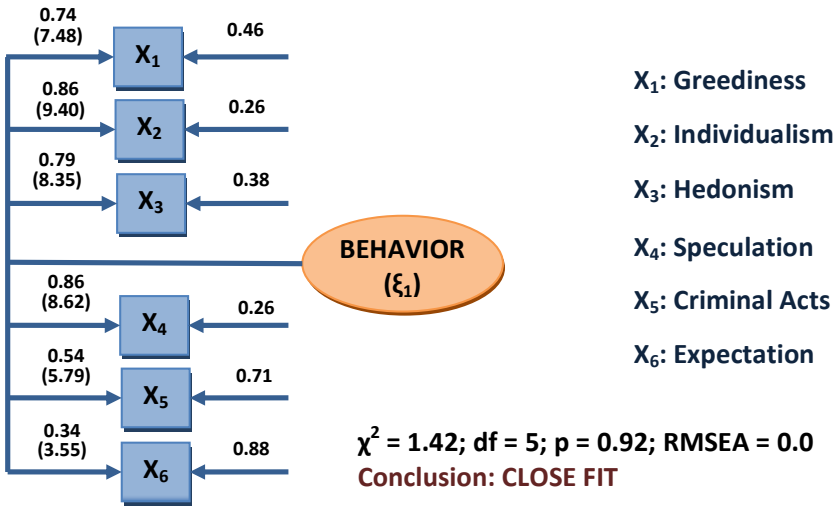


Figure 12. Measurement Model of BEHAVIOR

b. EXTERNAL

Measurement model of latent exogenous variable EXTERNAL satisfies three main conditions, namely, χ^2/df ≤ 3.0 (0.075/2), P > 0.050 (0.96) and RMSEA ≤ 0.08 (0.00). All

goodness of fit (GoF) measures is fit, so that we may conclude that measurement model of EXTERNAL is a good model with close fit (AGFI = 1.00).

All measured indicator variables (X_7 – X_{11}) are significantly caused by EXTERNAL. Business Cycle (X_7) has the highest loading factor (0.57), followed by National Disaster (X_8) and Intl. Currency System (X_{10}).

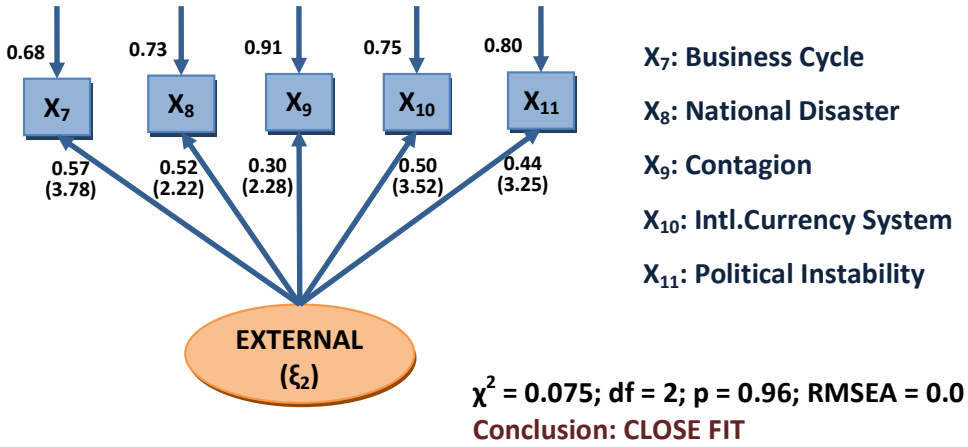


Figure 13. Measurement Model of EXTERNAL

c. GOVERNANCE

Measurement model of latent endogenous variable GOVERNANCE satisfies three main conditions, namely, χ^2/df ≤ 3.0 (1.11/2), P > 0.050 (0.57) and RMSEA ≤ 0.08 (0.00). All goodness of fit (GoF) measures is fit, so that we may conclude that measurement model of GOVERNANCE is a good model with close fit (AGFI = 0.97).

All measured indicator variables (Y_1 – Y_5) are significantly caused by GOVERNANCE. Poor Administration (Y_1) has the highest loading factor (0.98), followed in a distance by Lack of Regulation (Y_4) and Corruption (Y_2).

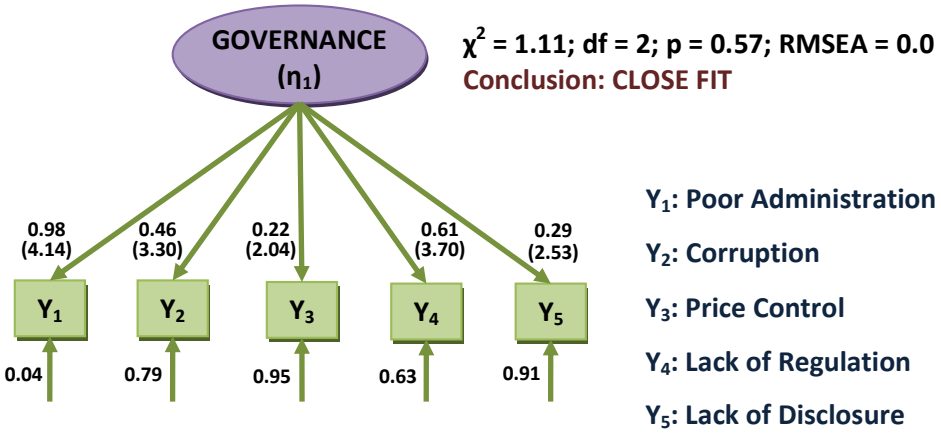


Figure 14. Measurement Model of GOVERNANCE

d. MONETARY

Measurement model of latent endogenous variable MONETARY satisfies three main conditions, namely, χ^2/df ≤ 3.0 (0.00/0), P > 0.050 (1.00) and RMSEA ≤ 0.08 (0.00). Goodness of fit (GoF) statistics show that the model is saturated, so that we may conclude that measurement model of MONETARY is a model with perfect fit.

All measured indicator variables (Y_6 – Y_{10}) are significantly caused by MONETARY system. Fractional Reserve Banking (Y_8) has the highest loading factors (0.73), followed by Fiat Money (Y_6).

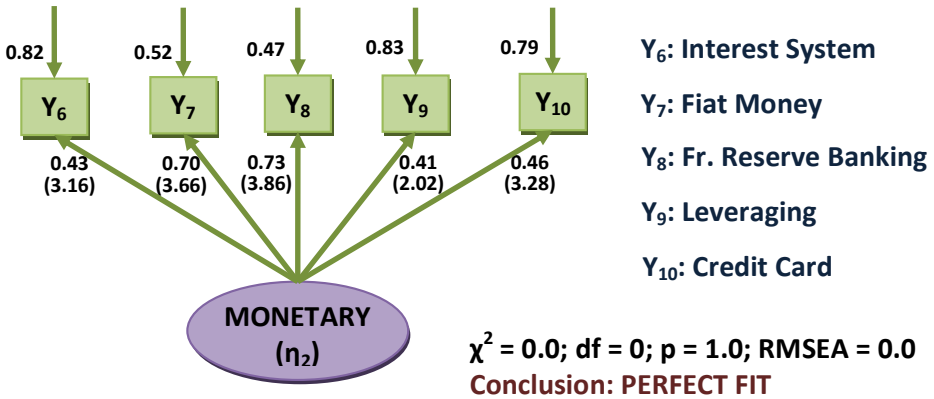


Figure 15. Measurement Model of MONETARY

e. FISCAL

Measurement model of latent endogenous variable FISCAL satisfies three main conditions, namely, χ^2/df ≤ 3.0 (0.00/0), P > 0.050 (1.00) and RMSEA ≤ 0.08 (0.00). Goodness of fit (GoF) statistics show that the model is saturated, so that we may conclude that measurement model of FISCAL is a model with perfect fit.

All measured indicator variables (Y_{11} – Y_{14}) are significantly caused by FISCAL system. Excessive Spending (Y_{14}) has the highest loading factor (0.95), followed in a distance by Fiscal Deficits (Y_{11}).

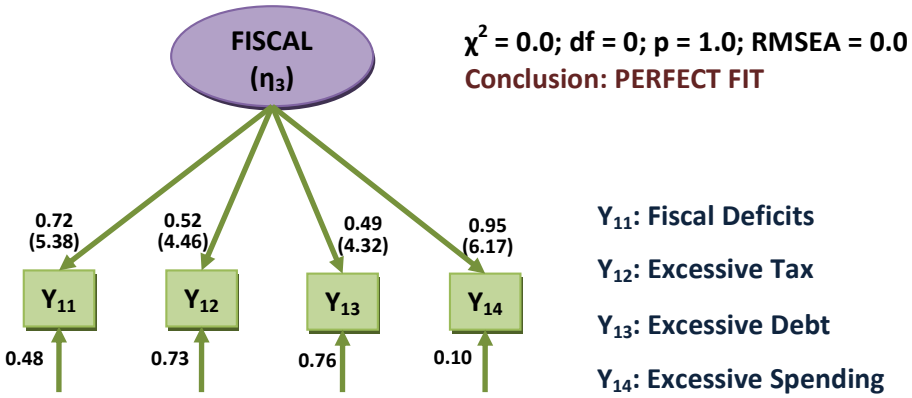


Figure 16. Measurement Model of FISCAL

f. CRISIS

Measurement model of latent endogenous variable CRISIS satisfies three main conditions, namely, χ^2/df ≤ 3.0 (7.68/8), P > 0.050 (0.47) and RMSEA ≤ 0.08 (0.00). All goodness of fit (GoF) measures is fit, so that we may conclude that measurement model of CRISIS is a good model with close fit.

All measured indicator variables (Y_{15} – Y_{21}) are significantly caused by CRISIS. Sovereign Debt Default (Y_{19}) has the highest loading factors (0.81), followed by Bank Runs (Y_{18}) and Stock Market Crash (Y_{20}).

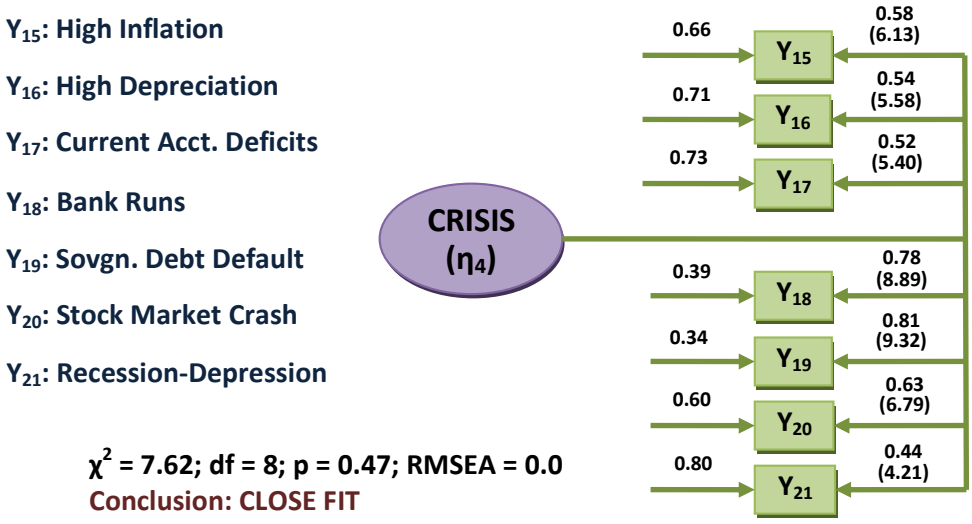


Figure 17. Measurement Model of CRISIS

4.1.2 Structural Model

Structural model of FINANCIAL CRISIS satisfies three main conditions, namely, χ^2/df ≤ 3.0 (275.47/247), P > 0.050 (0.103) and RMSEA ≤ 0.08 (0.033). All goodness of fit (GoF) measures is fit, so that we may conclude that structural model of FINANCIAL CRISIS is a good model with good fit (GFI = 0.86).

All five latent variables (2 exogenous and 3 endogenous) significantly cause CRISIS. FISCAL has the highest loading factors, followed by GOVERNANCE and MONETARY. Directly, BEHAVIOR negatively causes CRISIS (-0.89), while indirectly BEHAVIOR positively causes CRISIS through GOVERNANCE (0.35), MONETARY (0.32) and FISCAL (0.39). Overall, BEHAVIOR positively causes CRISIS (0.17).

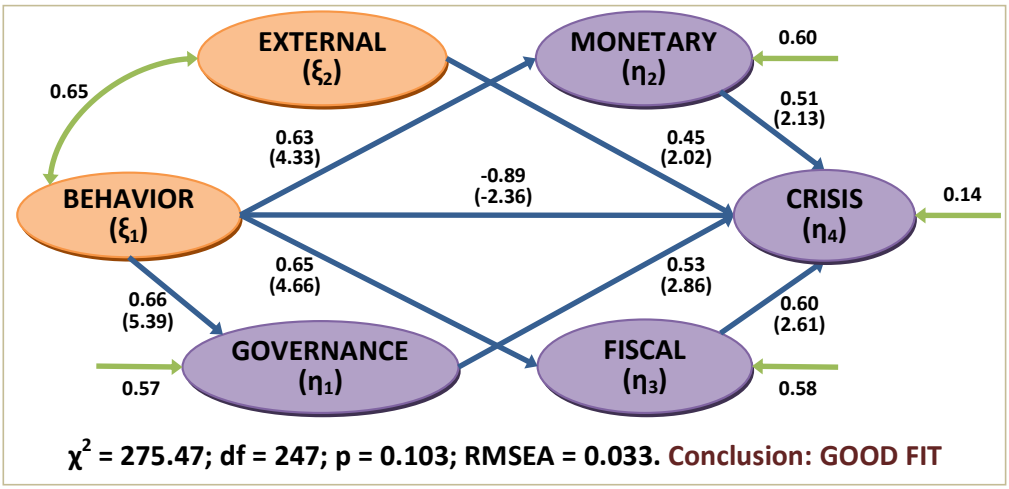


Figure 18. Structural Model of FINANCIAL CRISIS

4.2 VECM Results

Several procedures of data testing should be followed as a standard procedures for using VAR/VECM method, such as unit root test, stability test, optimum lag test, and cointegration test (see figure 3.5). After all requirements have been met, results can be generated. The complete results of all VECM procedures can be obtained from the authors.

a. Inflation Model

Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD) results of INFLATION model can be seen in figure 4.8. IRF results (see figure 4.8, left) show that almost all variable induce inflation or financial crisis (especially, interest rate 'INT' and administered price 'ADM'), except single global currency 'GOLD' and profit-and-loss sharing 'PLS' (prohibition of *riba* or interest) which reduce inflation or curb the financial crisis. FEVD results (see figure 19, right) show that interest rate 'INT' gives the highest

share (43.66%) to induce inflation or financial crisis, followed by administered price 'ADM' with 14.41% share, while single global currency 'GOLD' gives the highest share (8.03%) to reduce inflation or curb the financial crisis.

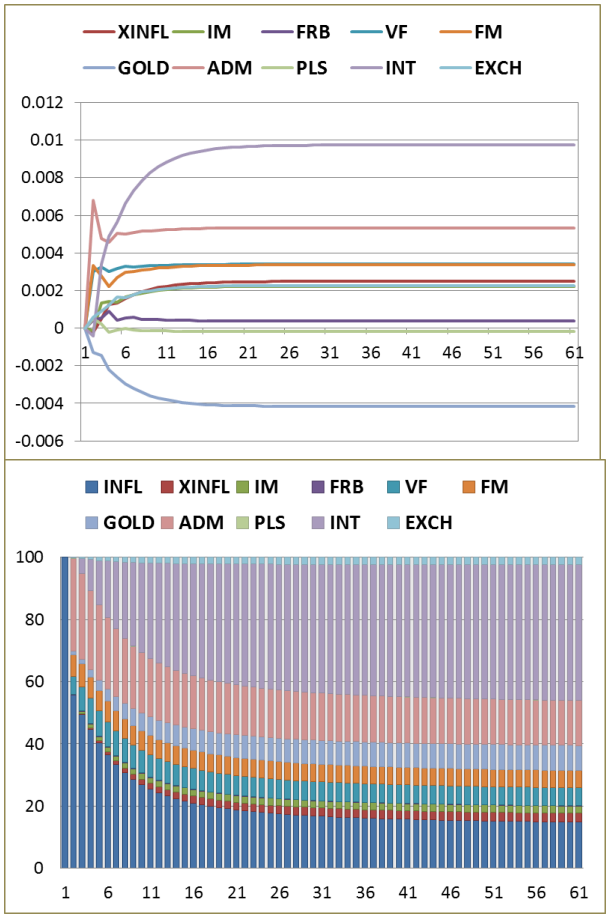


Figure 19. IRF and FEVD Results of INFLATION Model

VECM summary results of INFLATION model can be seen in table 6. All conventional variables (see table 4.1, left), including interest rate 'INT', fiat money 'FM', fractional reserve banking 'FRB' and multiple currency 'EXCH', as well as other control variables (see table 4.1, right), including volatile food 'VF', administered price 'ADM' and expected inflation 'XINFL', induce inflation or financial crisis. Some Islamic variables (profit-and-loss sharing 'PLS' and single global currency 'GOLD') reduce inflation or curb the financial crisis, while one Islamic variable (just money 'IM') still induces inflation or financial crisis (see table 6, center), since just money is proxied by using M1, where M1/GDP is far less than one.

Table 6. VECM Summary Results of INFLATION Model

CONVENTIONAL	ISLAMIC	OTHER
INT : (+), 43.66%	PLS : (-), 0.018%	VF: (+), 5.79%
FM: (+), 5.54%	IM: (+), 2.32%	ADM: (+), 14.41%
FRB: (+), 0.08%		XINFL: (+), 2.82%
EXCH: (+), 2.4%	GOLD: (-), 8.03%	

b. Growth Model

Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD) results of GROWTH model can be seen in figure 20. IRF results (see figure 20, left) show that half variables (especially, interest rate 'INT', fiat money 'FM' and volatile food 'VF') reduce growth or induce financial crisis, the other half variables (especially, fractional reserve banking 'FRB', just money 'IM' and single global currency 'GOLD') improve growth or curb financial crisis. FEVD results (see figure 4.9, right) show that interest rate 'INT' gives the highest share (24.85%) to reduce growth or induce financial crisis, followed by fiat money 'FM' with 13.49% share, while fractional reserve banking 'FRB' (8.02%) and just money 'IM' (5,98%) give the highest share to improve growth or curb financial crisis. The results consistent with the tight money condition in Indonesia (with M2/GDP less than 0.4), where loosening monetary policy will improve growth.

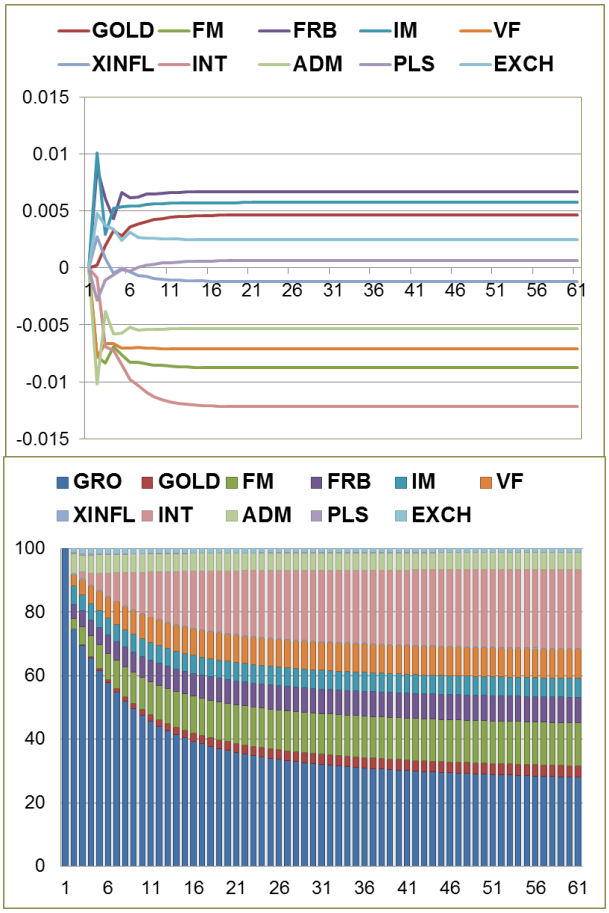


Figure 20. IRF and FEVD Results of GROWTH Model

VECM summary results of GROWTH model can be seen in table 7. All Islamic variables (see table 7, center), including profit-and-loss sharing 'PLS', just money 'IM' and single global currency 'GOLD', improve growth or curb financial crisis. All other control variables (see table 7, right), including volatile food 'VF', administered price 'ADM' and expected inflation 'XINFL', reduce growth or induce financial crisis. Moreover, two conventional variables, including interest rate 'INT' and fiat money 'FM', reduce growth or induce financial crisis, while the other two conventional variables, including fractional reserve banking 'FRB' and multiple currency 'EXCH', improve growth or curb financial crisis.

Table 7. VECM Summary Results of GROWTH Model

CONVENTIONAL	ISLAMIC	OTHER
INT: (-), 24.85%	PLS: (+), 0.09%	VF: (-), 9.11%
FM: (-), 13.49%	IM: (+), 5.98%	ADM: (-), 5.33%
FRB: (+), 8.02%		XINFL: (-), 0.24%
EXCH: (+), 1.21%	GOLD: (+), 3.50%	

c. Overall VECM Results

Finally, overall VECM summary results of INFLATION and GROWTH models can be seen in table 8. Two conventional variables (interest rate 'INT' and fiat money 'FM') as well as all three other control variables (volatile food 'VF', administered price 'ADM' and expected inflation 'XINFL') induce financial crisis through increased inflation and reduced growth (see table 8, left). Meanwhile, two Islamic variables (profit-and-loss sharing 'PLS' and single global currency 'GOLD') curb financial crisis through reduced inflation and improved growth. Moreover, two conventional variables (fractional reserve banking 'FRB' and multiple currency 'EXCH') and one Islamic variable (just money 'IM'), on one hand induce financial crisis through increased inflation, on the other hand curb financial crisis through improved growth.

Table 8. Overall VECM Summary Results

↑INFLATION and ↓GROWTH	↑INFLATION and ↑GROWTH	↓INFLATION and ↑GROWTH
Conventional		
INT; FM	FRB; EXCH	--
Islamic		
--	IM	PLS; GOLD
Other		
VF; ADM; XINFL	--	--

Overall VECM results have proven that fiat money and *riba* systems of conventional finance pillars are the main root causes of financial crisis, while gold money and profit-and-loss sharing of Islamic finance pillars are the main remedies for financial crisis. Moreover, government interventions which distort the market (volatile food and administered price), as well as expectation, are also the main root causes of financial crisis. Therefore, the government should not intervene the market directly, but the government should have authoritative *hisbah* institution to regulate and supervise the markets and their economic actors. In addition, *maysir* (speculation) should be totally prohibited, so that economic actors would not speculate or expect irrational returns.

V. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

a. Structural Equation Modeling

- All measured indicator variables have been proven significantly caused by their respective latent variables. The measurement model of MONETARY system and FISCAL system show PERFECT FIT, while others show CLOSE FIT.
- Highest loading factors are achieved by: 1) BEHAVIOR: Speculation (X_4) and Individualism (X_2); 2) EXTERNAL: Business Cycle (X_7); 3) GOVERNANCE: Poor Administration (Y_1); 4) MONETARY: Fractional Reserve Banking (Y_8) and Fiat Money (Y_7); 5) FISCAL: Excessive Spending (Y_{14}) and Fiscal Deficits (Y_{11}); and 6) CRISIS: Sovereign Debt Default (Y_{19}) and Bank Runs (Y_{18}).
- It has been proven that financial CRISES are caused by: 1) Group BEHAVIOR of economic actors; 2) EXTERNAL events; 3) Poor GOVERNANCE; 4) Unjust and unstable MONETARY System; and 5) Unjust and Unsustainable FISCAL System.
- Highest loading factors are achieved by FISCAL (0.60), followed by GOVERNANCE (0.53), MONETARY (0.51) and EXTERNAL (0.45). Directly, BEHAVIOR negatively causes CRISIS (-0.89), while indirectly BEHAVIOR positively causes CRISIS through GOVERNANCE (0.35), MONETARY (0.32) and FISCAL (0.39), with overall loading 0.17.
- Therefore, the root causes of financial crisis are structural in the FISCAL, MONETARY, GOVERNANCE and INTERNATIONAL systems, as well as in the BEHAVIOR of economic actors.

b. Vector Error Correction Model

- In INFLATION MODEL, all variables cause inflation except PLS-Profit and loss sharing and GOLD-Gold standard. It means that INT-Interest system, FM-Fiat money system, FRB-Fractional reserve banking system (MONETARY System), EXCH-International monetary system with multiple fiat currency (EXTERNAL), VF-Volatile Food due to minimum control and ADM-Administered Price that should not be controlled (poor GOVERNANCE) and XINF-Expected inflation (BEHAVIOR), contribute to financial crisis.
- The highest contributor to induce Inflation (CRISIS) is Interest system-INT (43.66%), followed by Price control-ADM (14.41%), Minimum control-VF (5.79%) and Fiat money-FM (5.54%). The highest contributor to prevent Inflation (CRISIS) is Gold standard-GOLD (-8.03%) and Profit-and-loss sharing-PLS (-0.02%).
- In GROWTH MODEL, all Islamic variables stimulate growth or hinder crisis (PLS, IM, GOLD), some conventional variables hinder growth or cause crisis (INT -28.85%, FM -

13.49%), while all other variables hinder growth or cause crisis (VF -9.11%, ADM -5.33%, XINF).

- Therefore, the root causes of financial crisis are structural in the MONETARY, GOVERNANCE and INTERNATIONAL systems, as well as in the BEHAVIOR of economic actors. INT and FM (MONETARY), ADM and VF (GOVERNANCE), as well as XINFL (BEHAVIOR) are the most dominant variables to cause CRISIS through Inflation and Growth.
- In INFLATION model, INT-Interest causes inflation (CRISIS) the most, so that lowering the interest rate will decrease inflation and prevent CRISIS most effectively.
- In INFLATION model, IM-Islamic money still causes inflation (CRISIS), since the proxy used for IM is money use for transaction-M1, which is still represents fiat money of conventional system. More proper proxy is needed.
- In GROWTH model, FRB-Fractional reserve banking still stimulates growth (or hinders CRISIS), since money supply needed in the economy-M2 is in shortage with the ratio of M2/GDP is less than 40% with decreasing trend. Therefore the expansion of money supply will stimulate growth.
- In GROWTH model, EXCH-Multiple international currency system still also stimulates growth (or hinder CRISIS), since under multiple currency system, the depreciation of one country's currency will improve the competitiveness of that country in international trade and finance.

5.2 Recommendation

VARIABLE	PROBLEMS	SOLUTIONS
MONETARY	- Interest System - Fiat Money - Fractional Reserve Banking	- PLS System - Intrinsic Money - Narrow Banking
FISCAL	- Excessive Spending - Fiscal Deficits - Excessive Debt	- Balanced Budget - Obligatory *Zakah* System - Domestic PLS *Sukuk*
GOVERNANCE	- Administered Price - Price Control - Poor Administration	- *Hisbah* Institution - Commodity Inventory System - The Right Man-Place
EXTERNAL	- Intl. Multiple Fiat Currency System - Business Cycle - National Disaster	- Intl. Gold Standard - Commodity Inventory System - Crisis Management

BEHAVIOR	- Expectation - Criminal Acts - Speculation	- Education - Prohibit *Maysir* in all markets - Supervision and Enforcement

- Structural reforms are needed in monetary system, fiscal system and governance, as well as in international system, which are more fair, just, stable and sustainable. Moreover, behavior of economic actors should be controlled by regulation and improved by education.
- The share of Islamic finance should be increased, while the share of PLS system in Islamic finance should be increased to improve the stability of financial system as a whole.
- International monetary system should move towards a just single currency system, which is not a currency of certain country. Gold standard is the most just and stable monetary system.
- To lower inflation, and at the same time prevent the CRISIS, interest rate should be lowered up to its optimal level.
- To stimulate growth, and at the same time prevent the CRISIS, M2/GDP should be gradually increased up to its optimal level.

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