Financial Stability
and the Global Landscape

Editors:
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Assalaamu ‘alaikum Wr. Wb,

We are pleased to launch this book. This volume contains the proceeding of the International Conference on *Promoting Financial Stability in The Changing Global Financial Landscape*, held at Jakarta–Indonesia, August 8 – 9, 2016. This is the 10th International Conference coordinated by the Bulletin of Monetary Economics and Banking, an international journal published by Bank Indonesia.

This book present the empirical findings, projection, in dept analysis, and thoughtful discussion from many researchers, academician, practitioneers, and policy makers. The angle of analysis is very interesting and rich, that we are sure the readers can understand the measure of financial stability, the causes, the dynamics, and its impact; not only globally or nationally, but also until the most disaggregated level of household.

One measure is the aggregate financial stability index (AFSI). You will find on this book how the AFSI is constructed from nineteen individual indicators and group them into four composite sub-indices. One chapter apply the intuitionistic fuzzy sets to put weights for the sub-indices and the quality level of financial stability in Azerbaijan, and provide strong evidence the
index is more capable to capture a major periods of financial stability.

Another interesting measure provided on this book is the early warning system (EWS); widely used as surveillance mechanism for preserving financial system stability. The major question on assessing the accuracy of the EWS is what indicator to use and how good they are on signaling adverse shocks towards the financial resilience.

Talking about the source of instability, one may easier to look at the externally source of shock, and one of famously recognized is the international imbalances. The imbalance in the current account has been debated for a long time. Deficits in the long term into often raises concern because of the economic crisis is often preceded by a prolonged of current account deficits. This book should keep the readers in mind if the current account deficit is not always caused by the inability of the economy to compete in the global market which makes the value of imports greater than exports. The current account deficit on the other side is a reflection of the saving - domestic investment position in the economy. If the deficit is caused by the position of investment larger than savings, then this is a good indication for an economy.

One chapter of this book investigate the external relation of Indonesia, and found the dynamics of Indonesian current account can be divided into two episodes; first is saving - investment period before crisis in 1997, and second, the export - import period after the crisis. The author used SVAR and conclude the exchange rate is the greatest influence on the current account dynamics. Furthermore, this chapter also provide the speed of adjustment for the current account to return to equilibrium pattern.

On the next chapter of this book, you will find the further discussion on international imbalances related to how strong one country to optimize the stability of his exchange rate, independency of his monetary policy, and how good they manage the fast moving in or out of fund in the era of free capital
mobility. This is simply the topic of trilemma where the interest is the best policy to impose to achieve higher economic growth amid financial crisis.

One section of this book provide the experiences of Southeast Asia countries. To measure trilemma, this paper uses balanced panel data approach from Indonesia, Thailand, Philippines and Malaysia during the period of 1980 to 2013. This paper includes trilemma index as independent variable alongside with inflation, openness and foreign currency reserve in explaining the variance of economic growth. Based on estimation result, it is found that during global financial crisis, exchange rate stability and financial openness policies induce higher economic growth compared to monetary independence as indicated by negative coefficient of monetary independence index. Nonetheless, those three policies are not statistically significant improving economic growth during East Asian financial crisis in 1997.

The second source of instability is the contagion and the spillover effect across regions. This book provide an empirical paper that investigates the macro-characteristics that reduce the spillover effect of unconventional monetary policy from developed countries to the emerging market countries. Empirically, this research used 24 UMP announcements and a panel fixed effects model to examine the characteristics of the emerging markets, the spillover channel considered in this study is countries’ exchange rate. Very interesting and empirically rich, the result shows that deeper financial markets contribute to better resilience. Trade linkages with China provide less vulnerable currency position of the emerging markets while trade linkages with developed countries provide mixed evidence. The macro-prudential policy and the capital flow measures that the emerging markets countries implemented before to the announcements are moderately effective in reducing the spillover.

On national level, financial stability is highly related to the monetary authority, particularly their credibility and the power of their monetary policy. In principle, the measurement of the
efficiency of monetary policy was based on inflation and output variations. Monetary policy is considered to be efficient if the policy generates low fluctuation of output and inflation. Low and stable inflation will encourage the output growth in the long term, while high fluctuation of inflation will cause a social loss. Some economists have tried to formulate the monetary policy efficiency measures such as Cecchetti (2006) and Romer (2006). However, these formulations still in a general form and cannot be used operationally. In this paper, the authors formulate a method for measuring the efficiency of monetary policy and applied to the data of inflation and output in Indonesia. The efficiency of monetary policy is measured by the deviation of actual monetary policy from ideal monetary policy. Ideal monetary policy is policy that creates a minimum variation of output and inflation.

Further investigation analyze how monetary policy may affect the comparative advantage of capital intensive industry (technology-intensive industry and human capital-intensive industry) in international trade. This is also important when we are dealing with international imbalances. Basically, the lower interest rates lead capital more affordable and the standard Heckscher-Ohlin model dictated countries with comparative advantages should export goods that require factors of production that they have in abundance.

From the opposite view, one may ask about how the financial stability influence the economic condition. Economic crisis that had happened at 1997-1998 in Indonesia triggered by financial condition that was not stable. It stimulates the researchers to study more. Since financial condition is a foundation in a country. So if economic crisis happened then many sectors will get huge impact of it. Financial stability means variables as export-import, GNI, GDP and inflation in a good range. Due to the financial condition consist of dynamic variables then to measure its stability the dynamic system is needed. The financial stability will be tested using time series analysis and dynamic system which is optimized by genetic algorithm. In this research gave result around 80% - 90% for accuracy data GNI,
GDP and inflation. Meanwhile, the accuracy of data export - import around 40% - 75%. These results proved that the dynamic system able to fit data in finding historical pattern with tolerance error.

To the end, the global stability will arrive on the household security. By standard definition, economic security of a household reflect their ability to achieve income necessary for covering their needs and to create financial reserves to use when a case of unfavorable accidence. We will interestingly follow how the educational and professional experiences, controlling for economy conditions, may affect the economic resourcefulness of household’s members and, as a consequence, their economic security. The case is presented by one of our author, Maria, for the case of Polish.

Grom global to regional economy, the ASEAN Economic Community (AEC) implemented in 2015 is a recent good sample. The agreement demanded the liberalization of the flow of goods and services, which enable the entry of foreign retail business across country members. To many extent, this is another source of domestic instability when the traditional market and Micro, Small and Medium Enterprises (UMKM) pose large proportion of corresponding economy. Usually, the major concern over the competition and the free market is the poverty. It is indeed the central problem to sustainable human development.

This book provide several insight on the poverty alleviation including the role of financial sector and the banking sector in particular. One paper discuss very neatly about the empirical evidence on Grameen Bank and Islamic Bank microcredit performance in Bangladesh. In general, most of the findings from the literature have shown that Islami Bank microcredit borrowers are doing well to reduce their vulnerability and poverty as well as improved socioeconomic status after access credit. Interestingly, many experiences suggests that social welfare projects sponsored by most of the NGOs in Bangladesh and elsewhere in Muslim countries tend to create a built-in
dependency. Once the support of the NGOs are withdrawn or the flow of aid stops for one reason or another, this project cease to exist or make its beneficiary worse off in the sense that discontinuation of support push them back beyond their original level of living.

Another paper on this book discuss the trend of commercial banks increasingly adopting stricter credit evaluation standards in giving loans to micro-entrepreneurs. This study propose the use of ‘cash waqf’ as an alternative and an additional source of capital for microfinance to promote the growth of Islamic microfinance in Muslim countries in general.

Islamic banking ability to survive of the economic crisis in 1998 is sufficient to provide evidence that it can play a role in maintaining the stability of the financial system in Indonesia. This was absolutely influenced by the various types of financing contracts that Islamic banks offer to their customers. Therefore, this study aims to determine the best portfolios simulation of Islamic financing that can maintain the stability withstand to economic shocks.

Related to the fundamental side of the financial stability, a very basic question we try to bring to all readers is who use the financial product? Worldwide, an estimated 2 billion working-age adults globally—more than half of the total adult population—has no access to the types of formal financial services delivered by regulated financial institutions that wealthier people rely on, (World Bank, 2014). Instead they depend on informal mechanisms for saving and protecting themselves against risk. They buy livestock as a form of savings, they pawn jewelry, and they turn to the money lender for credit. These mechanisms are risky and often expensive.

Currently, the highest score for Financial Inclusion Index goes to Peru (90), Columbia (86), Philippines (81), India (71), and Pakistan (64); while the five lowest ranks are Haiti (24), Dem. Republic of Congo (26), Madagascar (27), Lebanon (29), and Egypt (29). For another country in Asia, Indonesia scored 56,
Cambodia (55), Thailand (49), and Vietnam (34), while China record 42. All these figures are much lower than the Philippines, (Global Microscope, 2015). Regionally, the following table provides initial insight of the financial inclusion determinants for East and South Asia.

The issue of financial inclusion is highly related to the structure of banking industry. With a highly diverse size and margin, the implementation of Asean Economic Community and regional arrangements (ASEAN 10), the ASEAN + 3 (China, Japan, Korea), the RCEP or ASEAN+6 (China, Japan, Korea, India, Australia, NZ), and the CEPA (Thailand & RoK) leave big challenges for the government, financial authority, and local banks in each country member to reconcile and to adopt.

Again, we always need to look the issue from different perspective. As you will find on this book, the financial inclusion is one of strategy on one hand but may cause instability in the financial system when financial inclusion causes reducting in credit standard, increasing risk of bank reputation, and uncoresponding regulation in microfinance. One way to test it is by testing their causality, and this book provide the empirical test including 19 countries based on income group from 2004-2011.

The next section of this book present the keynote from the Governor of Bank Indonesia, followed with very interesting plenary sessions. We strongly suggest all the readers to follow the thoughfull, open, yet humble presentation from Perry Warjiyo, Halim Alamsjah, and Suahasil Nazara.

To conclude our introduction before you continue your reading, we emphaisize that all papers on this book are subject to a review to ensure the comparative framework and analysis that holds the papers together on explaining the theme of the conference. For this succesfull task, we greatly appreciate the contributions of all Scientific Chairs of the conference.

This Proceeding book is available on printed on digital. Both cover regional and international distribution. We invite all
the readers to read and disseminate this book, which we believe will enhance greater discussion within the growth and macroeconomic stability issues. We gratefully acknowledge the contribution of Triatmo Doriyanto, Rita Kristiana, Shinta S., Nurhemy, Tri Subandoro, Aliyah Farwaha, Sendy, Junita, and all the team during the publishing this book. To reach broader reader and to intensify further discussion, any individuals or institution can print the book with written notification to the editors. Furthermore, printing on demand may also available.

We expect this book provides systematically presented literatures on the Growth and Macroeconomic Stability for all readers, and encourage them to participate on the upcoming Conference 2017 and beyond.

Wa’alaikumsalam Wr. Wb.

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Moderator:
Edhie Purnawan
Vice Dean of Gadjah Mada University
Assalamu’alaikum Wr. Wb,

It is a great pleasure for me today, to address this distinguished gathering and welcome you to the 10th International Conference, Bulletin of Monetary Economics and Banking 2016. I am indeed delighted to see distinguished speakers and guests from my fellow from government institutions, researchers, embassies, and academia attending this conference.

This year, we are pleased to conduct a conference entitled “Macroprudential Policy to Promote Financial Stability in the Changing Global Financial Landscape”. The topic of today’s conference is very timely, as many new developments continue to loom in the area of financial stability that entails us to keep on adjusting our policies to the newly emerged development so as to maintain our
credibility as central bank in providing conducive climate to promote sustainable economic growth.

As the current global recovery moved only at a sluggish pace, while the current government is at the height of boosting the economy, we are of the view that credible effort is needed so as to maintain financial stability while at the same time supporting government program to improve the living standard of our people.

**World Economy**

Entering the second half of 2016, the global economy continues its feeble and fragile recovery in the face of considerable uncertainty that has gripped us since the global financial crises of 2008. In addition, the world financial markets are surprised to see the outcome of the U.K referendum called “Brexit”, which could aggravate the global outlook for 2016-17, notwithstanding better than expected performance in early 2016. With declining global growth and renewed uncertainty following Brexit is still unfolding, the baseline global growth forecast has therefore been revised down modestly relative to the April 2016 as reported by WEO.

The result of the U.K. referendum that caught financial markets by surprised has led to financial turbulence worldwide. The pound depreciated sharply, while other major currencies saw limited pressures. In emerging markets, asset price and exchange rate have been generally more stable. Overall, the outcomes of Brexit vote imply substantial repercussion covering economic, political and institutional fronts. It is presumed to give a negative macroeconomic impact, especially in advanced Euro area economies. However, as the process is still unfolding, we have yet to assess the damage to the world economy. As for Indonesia, however, we envisage that the impact of Brexit to Indonesian economy is limited and the economy continues to steam ahead.

The outlook for emerging market economies remains diverse. In China, near-term outlook improved following the recent policy support by the fiscal and monetary authorities.
Infrastructure spending has picked up and credit growth improved. In Brazil, the economy seemed to have been bottoming out, as contraction receded. In India, the country continued to see the thriving economy, despite lower than expected pace. Meanwhile the Middle East oil exporting countries saw modest benefit due to recovery in oil prices, but fiscal consolidation remains necessary.

**Domestic Economy**

Despite tangible results from efforts to enhance resilience to external shocks, the vulnerability of emerging economies remains, due to their rather weak economic structures. Indonesia’s economy in particular, has managed to pick up its growth in 2016 supported by increased government consumption on goods and investment in infrastructure projects. In addition with the passage of Tax Amnesty Law last June, we expect this would boost market sentiment, leading to stronger capital inflows and firming rupiah exchange rate. We envisage that tax-amnesty-induced capital flow would peak towards the end of this year. We are confident that these developments should benefit investment and other economic activities in general.

Broadly speaking, macroeconomic stability is well preserved. Domestic economic activities in the second quarter of 2016 are seen to record an improvement. Improved private consumption as well as large increase in the realization of government capital and goods programs becomes the major impetus of domestic economic growth amidst weakened exports. The overall growth in 2016 is expected to stay within the target range of 5.0-5.4% (yoy).

At the external front, Indonesia’s balance of payments recorded narrower current account deficit in June 2016, primarily originating from increased trade surplus stemmed from higher non-oil manufacturing exports. At the end of June 30, 2016 foreign exchange reserves stood at $109.8 billion, enough to cover 8.4 months of imports or 8.1 month of imports and servicing public debt, well above the international standards.
The strengthening confidence on Indonesia’s economy contributed to a more stable Rupiah with an appreciating trend and lower exchange rate volatility. This comes on the back of favorable macroeconomic fundamental, as represented by narrowing current account deficit, lower expected inflation, and renewed positive sentiment towards economic prospects. The Rupiah recovered its value against the dollar, following its depreciation in the earlier months as risk mounted in the global financial market due to the anticipated Fed Fund Rate hike. But it makes a turnaround following the recent announcement of new cabinet by the President.

The consistent monetary policy to maintain macroeconomic stability, accompanied with policy coordination between Bank Indonesia and the Government, succeeded in bringing about low inflation. We are on track towards achieving low and stable Rupiah. In the past two years, Indonesia has managed to contain inflation at the level below 5% supported by lower energy prices and better food production and distribution. We believe that this process will continue.

Inflation is well under control in July 2016 at a low 0.69%, leading to 3.21% yoy inflation. The whole year inflation is envisaged to move well within the target corridor of 4 ± 1% for 2016. Policy interest rate—BI rate— is left unchanged at 6.5%, along with deposit facility and lending facility at 4.5% and 7.00%, respectively. Bank Indonesia also announced the BI-7-Day Repo Rate is maintained at 5.25%. This will serve as policy rate to replace BI rate, with effect from mid-August this year.

**Financial System Stability**

Financial system remains stable, on the back of resilient banking system, supported by stronger capital ratio and liquidity, as indicated by persistently improved index at 0.87% in May 2016. Nevertheless, we should be mindful on moderating banking intermediation as well as increasing credit risk.

Bank deposit grew at about 6.53% (yoy) in May 2016, while credit moved higher as compare to previous month at
8.34% (yoy). Credit to SMEs also grew at 8.0% (yoy) along with increased risk. Meanwhile, Micro Credit Program (MCP) has reached almost 50% of its target in 2016, mostly from state-owned banks. With domestic demand expanding at modest pace, non-performing loan is slightly increased and recorded 3.11% in May 2016, brought about by increase of non-performing loans in industry and trade sectors.

Banking industry is well capitalized; its ratio continued to increase and reach a high 22.15% in June. Bank liquidity also remains ample, supported by government expansion. Albeit operating expense-operating income ratio increased and return on assets ratio decreased, banking industry remains intact. Overall, we remain optimistic that our banking and financial stability is well preserved. Notwithstanding, we should carefully monitor the emerging global fragilities.

**Outlook, Risks and Policies**

Against the background of maintained stability while anticipating the possible renewed vulnerabilities, we remain optimistic that domestic economic growth is envisaged to pick up modestly in 2016, supported by measured monetary easing and more accommodative macro-prudential policies, fiscal stimuli in the form of the Tax Amnesty Law, and stronger government spending.

Yet, we are aware the prevailing of some overshadowing risks on the horizon, both external and domestic origins, including the widely expected another Fed Fund Rate hike in the second half of 2016. Equally important is the risk of the slowdown in the Chinese economy, the aftermath of U.K’s Brexit, and the rising of volatile food inflation domestically.

**Distinguished Guests, Ladies and Gentlemen**

In this opportunity along with the 63th anniversary of Bank Indonesia, we proudly launch a newly published book entitled “Perjuangan Mendirikan Bank Sentral Republik Indonesia” (The Fight for Establishing the Central Bank of the Republic of Indonesia).
This book is written with the aim to highlight issues related to establishing our central bank from Bank Indonesia’s perspective.

The process of establishing a central bank in Indonesia begins with the announcement of Government Regulation in Lieu of Law Number 2 of 1946. The Government established Bank Negara Indonesia 1946 (BNI 46), responsible for implementing central bank mandates. In the event, however, this newly created central bank was confronted with difficulties, namely incompetent and inexperienced staff, limited branch offices networks, and political instability. It failed considerably to function as a circulating bank.

As the political process continued and as a consequence of the Dutch-Indonesian Round Table Conference held in the Haque 1949, to end Dutch occupation in Indonesia, it is agreed that De Javasche Bank was to take over responsibility as circulating bank from BNI 46. De Javasche Bank should undertake a number of issues.

The first is that central bank as the issuer of currency would like to encourage its people to use their own banknotes in their transaction within the Indonesian territory. This measure is to show to the world the sovereignty of the government of the Republic of Indonesia during its early years of independence. The second is to reaffirm that Bank Indonesia is absolutely not the legacy of the previous Dutch administration. The overtaking of De Javasche Bank by the Indonesian government is done through purchasing its stock, adhering to international best practices. It is not a nationalization. The third is to help the newly born government in financing its budget needs, at the time. Of course as time evolves, the central bank is now mandated to promote macroeconomic and financial stability.

_Distinguished Guests, Ladies and Gentlemen,_

The next book we also proudly launch entitled “Mengupas Kebijakan Macroprudential” [Unveiling Macroprudential Policy]. This book aims to enhance public understanding on macroprudential issues, so that it helps promote greater effectiveness in managing
systemic risk as well as financial imbalances to safeguard financial system stability.

The global financial crisis prompted a rethinking of macroeconomic policy framework. There is a global consensus that monetary and financial stability are interrelated, hence it should be taken into account in designing policy formulation. Bank Indonesia, and some other emerging economies, has adopted macroprudential policy as an integral part of its macro-monetary policies after the Asian financial crisis of 1997/98.

It is worth noting that microprudential policy has been transferred to Financial Services Authority under the Act No. 21 of 2011 concerning Financial Services Authority. Both macroprudential and microprudential should complement each other. Macroprudential policy seeks to oversee, assess, and deliver appropriate response to the evolving financial system as a whole, rather than focusing on individual institutions or certain economic measures and isolation. Central bank is naturally position to play a prominent role in macroprudential policies.

Macroprudential issues in international level are a fairly new field in macro management area, not discussed widely until just recently. Not too many people have solid understanding of the substance of macroprudential policy. Thus this book would bring a better perspective on macroprudential issues and policies, and it should contribute to the success of its implementation.

Lastly, this book shed light on the evolving roles of Bank Indonesia as the guardian of monetary stability to improve the living standards of our people. It also talks about the macroprudential policy strategies in Bank Indonesia, particularly how Bank Indonesia conducts crisis prevention and resolution.

Research and Publication
As we may all know that the Bulletin of Monetary Economics and Banking, a peer-reviewed journal, has four missions, namely: (i) to encourage research activities from academia and public in general; (ii) to provide medium of knowledge sharing for researchers; (iii)
to facilitate dissemination of research findings; and (iv) to bridge
the gap between theory and practice in the area of monetary
economics and banking, and related topics in finance and
economics, and macro-prudential, the theme of this year event. It
is expected that BEMP will be internationally accredited in the
very near term. The Journal is published four times a year, and
available in the digital and printed version.

Quality research and data are an integral part of policy
formulation in Central Bank. Understandably the policy will impact
all walks of society. To this end, Bank Indonesia continues to
enhance research platform, including seminars, call for papers, and
the publication of internationally accredited journal. In this regard,
we challenge policymakers, researchers and academia to share
their valuable knowledges and thoughts.

Furthermore, Bank Indonesia does not conduct research
in isolation. It involves wider stakeholders. This is the reason why
Bank Indonesia invites researchers from all parts of Indonesia and
around the world to participate in BEMP's call for paper. It is
expected that the participants could enhance their research
networkings with other researchers, authorities, and practitioners
through this Conference.

In this occasion, we are pleased to announce that we also
hold a research fair for the first time in Bank Indonesia. The
research fair in which you could find various papers and books
published by Bank Indonesia, is intended to disseminate the
outcomes of research projects and a range of books written by our
internal staff or in collaboration with outside researchers.

Looking to the future we see challenges on the horizon.
We have to promote a strong synergy between maintaining
stability and supporting far reaching government economic
programme. Macroeconomic stability is indeed worth promoting
for as it is the prerequisite for sustainable growth. Thus, through
this conference I wish you all to have an intense but fruitful
discussion. I am confident that by the end of this conference we
could deepen and enhance our understanding of the issues being discussed as a take away and food for thoughts to bring home.

I thank you for your kind attention.

_Wassalamu’alaikum Wr. Wb_

Thank you,
Jakarta, August 9, 2016.

_Agus D.W. Martowardjo_
_Governor of Bank Indonesia_
Financial Stability in Volatile Environment
The Experience of Indonesia

Halim Alamsyah
Chairman of Indonesia Deposit Insurance Corporation
Board of Commissioner

After the Asian financial crisis broke out 16 years ago, most central bank, in Asia especially put serious effort in strengthening their surveillance on the built up of financial risk or systemic risk coming out of financial imbalances of balance sheet from financial firms, banks, nonbank financial institutions as well as nonfinancial firms including commercial enterprises and households. Asian’s central banks were more incline to use macroprudential regulation with the view to maintaining financial stability. So, this is actually what we call now as macroprudential policy.

After the great financial crisis in 2007–2008, the incarnation has just compounded because it is not only emerging economies but also advanced economies are now trying to use macroprudential policy. There is already a lot of research has shown empirically as well as theoretically that monetary policy alone will not be sufficient maintaining macroeconomic stability (price stability does not guarantee macroeconomic stability). In
fact, this research has found that low inflation especially in advanced economies with low yield on financial assets tend to promote excessive risk taking and dangerous financial imbalances. In a globalized financial landscape right now, the search for yield motives has induced more capital flows into and out of emerging economies with less developed financial markets and does create excessive volatilities and which in turn can create financial instability in many of these small and less developed financial markets.

Recent experience has shown that cooperating in financial stability mandate is necessary to maintain macroeconomic stability. But cooperating in financial system stability is not that easy; it is a wide objective and it is much broader mandate if it compares with monetary stability. It has many wide aspect and intellect ages. It is almost impossible if those matters are being born by one institution. Increasingly, financial stability is seen as a shared responsibility. Despite some debates, whether financial stability mandate should be given only to the central bank, it is important to be aware about the strength and the limit of each policy: macroeconomic policy, monetary policy, as well as microeconomic policy.

Monetary policy instruments are well known for each broader impact to the economy but less capable to deal with sectoral risks and financial imbalances while macroprudential instruments are more direct and can be targeted to specific risks or financial imbalances. But unfortunately, there are still many unknown on the efficacy of these macroprudential regulations. Not rescinding our knowledge on transmission mechanism, trade-offs, and optimal combination of these instruments in effecting output prices and financial stability.

So when we are talking about trade-offs, actually we are talking about something that we are not familiar with. Unfortunately, central bankers do not have enough time to do some research before actually apply it. When the problems emerge usually central bankers have to act based on intuition and professional judgment. And fortunately, some of the central bankers in the world are still retaining the financial supervision
authority inside the central bank. Thus they have in a way, maybe the right hand or the left hand to help the monetary policy objective. If a country does not have that kind of authority, then those authorities related have to coordinate, including Indonesia. However, trade-offs is not the same as coordination. Trade-offs is related toward the nature and the efficacy of the regulations if we are talking about coordination between micro and macro regulations. But coordination is about how to achieve a single objective or a common objective and try to make a good planning and sequence and such that we can have an optimal impact on the targeted objective.

As we all know, when the unconventional monetary policy has rattled the global financial landscape, it has created many spillovers especially on capital flows to many emerging economies including in Asia. And as we all know also, many emerging economies in Asia in particular has to resort to some capital flows measures or capital flows management. One of the key reasons to do this because the authority would like to maintain the competitiveness while adopting a monetary policy’s stand conducive to manage their economic growth momentum. Instruments such as regulations to manage foreign exchange maturity and denomination mismatches, capes on external debt, taxes on foreign asset holdings, or even lengthening its holding period are commonly used. These instruments are commonly also accompanied by stricter prudential regulations on bank’s liquidity position, capes on property and consumer loans, in effort to manage a safer and resilient banking system and a more productive composition of output in the economies. These policies respond are coming out of research and closer surveillance on the sources on financial vulnerabilities. Discussions on these topics are widespread right now in many regionals as well as in many forums.

In the Indonesia context, as a small and open economy, sources of financial instability may come from external factors as well as internal one. The external factors are notorious as the financial sector is getting more integrated into a more globalize financial system. As we know the word contagion, herding
behavior, risks on, risks off are very notorious buzzwords. On the internal side, we are talking about home global vulnerabilities and usually in macroeconomic perspective these home global vulnerabilities will come out of balance sheets of financial firms and nonfinancial firms including households. And the central bank or any institution that are tasked by macroprudential and macroeconomic stability objective need to take those phenomena seriously. Furthermore, financially risky behavior such as excessive risk taking both from the demand side: households and deficit units firms and from the supply side: lower lending standard for example or maybe lower capital adequacy ratio as a presentation of lower loss absorption capacity are also important to be monitored. Last but not least, shocks related to policies taken in the financial area should also be closely watched when those policies are deem not in line with “market's consensus or market’s expectation” and thus it may have unattended consequences.

A framework analysis: linking financial system stability with macroeconomic policies is very useful especially in identifying the sources of financial imbalances and possible risk register that need to be analyzed and monitored closely. Financial stability mandate covers a wide coverage of a need in extensive information and data mining covering not only banks, but also nonfinancial institutions as well as corporations and households. And that is the reason when we are talking about financial stability; it is a wide coverage and very wide mandate. A good grasp of understanding on what is going on in financial monetary, fiscal, and real size of economy is a must. Not resending a good coordination and collaboration with other financial authorities, in Indonesia that means a good collaboration and coordination with OJK, Ministry of Finance, and also Indonesian Deposit Insurance Corporation.

Now we will talk about how Indonesia has already taken some macroprudential regulations to maintain financial stability. During the last financial cycle upturn in Indonesia, it is quite easy to spot at least three phenomena took place about the same time. The first is excessive lending growth, the second is price bubbles
in property sector, and the third is acceleration in external debts especially private external debts.

In the last financial upturn, a famous phenomenon named procyclicality of loans growth was happened. When the GDP growth is accelerating, it will also induce the same acceleration in loan growth, including in this case mortgage or KPR (Kredit Perumahan Rakyat). When the GDP growth is accelerating, it also shows the same development in KPR. Based on data from September 2001–March 2015, the total mortgage is much more responsive comparing to the total loans. This is the first phenomenon.

And secondly, we can also look what happened with the property sector. There was very high growth of property loan since middle 2010 has been accompanied by bubble in property prices. Whenever the GDP growth is increasing above the trend line, the credit growth would also grow above the trend. And after so many years being dormant, the property price suddenly shot up especially during 2010 and over currently is bit declining. And during that period, it is also quite clear that the speculation is rampant. Many debtors have more than 2 mortgage loans at the same time. In fact, at the time it was quite common to see 1 debtor has more than 2 or even more than 3 loans. And this is one of the reasons why the property price shot up leading toward price bubble eventhough the distribution of this price increases would not spreading throughout Indonesia. But at least, this is the first phenomenon that we should take care very carefully.

And what is more interesting, eventhough the loan growth has already grew by over 40% during the same period, we still saw an acceleration in private external debt. This is what we call as “business cycle”. Business cycle is characterized by the GDP growth, ups and downs. But if we are talking about financial cycle, we are talking a much longer and much deeper and also higher amplitude of the cycle. So it is possible actually at financial cycle, the GDP growth is slowing down but the financial cycle is still on the rise. This is what happens in Indonesia.

The total external debts have increased for about 24% in 2012 to 36.5% in Q1 2016. The ratio of private sectors over total
external debt is soaring from 36% (2014) to 52% (Q1 2016). Only recently the private sector external debts is slowing sharply since 2012. But it might indicate at the same time of the slowing growth of business expansion. Now we are having a slow down in business cycle, but at the same time we may have a slow down in financial cycle. So when these two cycles are coincided, usually we will have some difficulties in reviving the economy and also in reviving the financial sector.

Then the situation from our corporations, the domestic corporations show a weakening performance and especially on commodity sectors. And we hope the revival of commodities’ market during the last several months will have some relieves of some companies and we do hope that it will be the trend. But if not, the world of cushion is really inappropriate.

Next, it is about the policy responses have been given by Bank Indonesia especially. When we are talking about trade-off, what we need is actually the knowledge, whether we know exactly what are the objectives of monetary policy as well as what are the objectives of macroprudential policy. As long as we know which policy affects which sectors then we may have the chance to have a good policy design. Monetary policy affects the magnitude and the pace of output and prices because macroprudential policy will not be able to reduce inflation for example, it is only part of price pressures. While macroprudential policy will handle the composition of output. If we do not want the loan growth too high for some sectors for example, then we may be able to tweak growth in those sectors. And sometimes we can also contain some imbalances especially when it is coming out of some imprudent behaviors. This is what the policy responses have been taken by Bank Indonesia. If we look at what happened during 2012–2015, BI has taken tight-biased monetary policy and it adopted more flexible exchange rate regime. At the same time, BI also administered macroprudential regulation in the area of liquidity of the banking sector, foreign exchange transaction, directly try to contain property and consumer loans, and try to look and reduce financial imbalances in the corporations’ balance sheet. Then since the last quarter of 2015, because the economy is slowing down, BI
has switched to a laxer monetary policy and it has already reverse some of the macroprudential regulations such as higher LTV ratio or lower reserve requirements. Whether it is effective or not to revive the economy, we still need more research before we can do a more objective evaluation.

This is one illustration how effective is LTV ratio regulation. Seeks that during the first and the second LTV ratio regulation, when the economy is already slowing down, this is the peak when the mortgage loan growth was very high. And it is slow down gradually before peak up a bit before BI took second LTV. But after that, the loan growth was declining. But now, the key question is whether the last relaxation of LTV will have the same symmetry response from the market, from the property side whether it can also jump start a revival in loan growth of property sector.

What we have learned so far, some researches in the area of financial stability has been accelerating and new findings and understandings has also been quite encouraging. But, there are still much yet we still do not know. Mandate on achieving financial stability is currently given only to one institution. In coordination arrangement toward a distributed model like Indonesia for example, complicated and fragmented decision-making process should be avoided as it only create confusion, lack of credibility, and maybe also late responses. So, strong coordination and collaboration is needed to harness the potential synergies among policy makers.

The shape of real coordination will depend on the effectiveness of governance’s process and structure, the instrument choices, as well as coordination culture. Nevertheless one thing is clear, that each policy maker must have a common understanding about the efficacy and the limits of its policies, as such that monetary policy is to focus on price stability while macroprudential is to limit the builds up of system wide financial risks and microprudential regulation focus on the safety and the soundness of individual financial firms. So the trade-off may in fact be minimize if those policies can be designed as a complementary to each others.
Success in financial stability during normal period may not be taken for granted, that it will also work during stress or crisis situations. Thus a clear guidance on crisis management protocol and a lead institution will be critical in ensuring effective and fast policy responses. When dealing with financial stability matters, our experience shows that prompt corrective actions are desirable as prevention is much better.

Lastly, achieving financial stability is not a clear-cut mandate as like monetary target. We can speak inflation target or interest rate or money supply very easily, but when we are talking about financial stability it will be not that such clear. So legal and political shield is a must in ensuring decisive an objective policy responses.

Thank you,
Jakarta, August 9, 2016.

Halim Alamsjah
Chairman of Indonesia Deposit Insurance Corporation
Board of Commissioner
The Central Bank

The Role of Central Bank to Support Financial System Stability

Perry Warjiyo
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There are three aspects that will be explained in this paper. First is we define what the financial system stability is. This important to let us stand on the same ground of understanding. Second, this paper will identify and emphasize the role of Central Bank on financial system stability. This section is based on theoretical concept, existing literatures, as well as our empirical experiences. Third section will discuss and answer the question of how we marry the monetary and macro-prudential policy conceptually in Bank Indonesia.

Financial System Stability
The global financial crisis reminds us the important of financial system stability. In every crisis, we are searching the new factors and finding the new impetus for policy. This financial system stability is what we invent since the global financial crisis. A

1 We invite the reader to read Solikin J. (2010). Central Bank Policy and Practice, Bank Indonesia, Ch. 14 and 15.
number of definitions has been put in the literatures. We can refer to Sinasi (2004), he said that the financial stability was defined as a financial system which arranges of stability that capable of facilitating rather than impeding the performance of the economy.

The ECB define as well as Central Bank in Indonesia, that the financial system stability crisis prevention is financial stability as condition in which the financial system, intermediaries, market, and market infrastructure can withstand shock without major disruption in financial intermediation and in the general supply of financial services. This is the definition that we can infer from a number of literatures which are concluding into the following 5 key aspects that we learned from crisis to crisis.

The 5 key aspects of financial system stability. The first is that the financial system stability is not only about the individual soundness of the financial system. Soundness of the bank is very important, soundness of financial institution is important, in necessary but not enough.

The second aspect of financial system stability is the causes. If we learnt from the crisis, there are four causes which are inherent with financial system stability; (1) excessive lending, (2) excessive external borrowing, (3) asset price and property bubble, and (4) capital reversal. These are the four aspects of inherent risk of financial system stability. Mexican crisis, Latin crisis is caused by public external debt crisis. Asian crisis is caused by private external debt and the banking crisis as well as the balance of payment crisis. The reason of financial system stability's pressure is coming from the capital reversal. So, second key of financial system stability is we have to understand the causes of the crisis, they are excessive lending, excessive external borrowing, asset price and property bubble, and capital reversal.

Third aspect on financial system stability is the important of interconnectedness in the financial system. The crisis can be caused by individual banking, capital reversal and price bubble, but the systemic risk, the propagation of the crisis in the financial system has interconnection. These may be cause the domino effect from bank to bank and central counterparty risk in the payment system.
The fourth aspect of financial stability is about the contagious aspect, the herding behavior, which is very difficult to predict and very difficult to model. The crisis can be happen because the individual banking, external crisis, propagation of the interconnectedness. While, in the term of herding behavior, the information contagion is the thing that makes the crisis become so difficult to predict and resolved. See what happen in US, the crisis is not because of the individual bank, it is because of excessive lending and housing price bubble. Facilitated by structured product, interconnectedness in the financial market, the propagation and the difficultness of resolving those crisis is cause of information contagion.

Lastly, the fifth aspect of financial stability is the share responsibility. Halim Alamsjah emphasize that financial system stability everywhere from the beginning, now and to the future is a share responsibility. There is no way a single issue can assume and can be accountable of financial system stability. Central bank cannot do financial system stability alone, financial service authority cannot do financial system stability alone, and Indonesia Deposit Insurance Corporation cannot do financial system stability alone, and also the minister of finance. A share responsibility is a must because the crisis can be happened from the bank, the global, external debt, as well as other aspects of financial infrastructure.

This is a strong reason why in Indonesia, financial system stability particulary prevention and resolution policy are mandated among the four agency; Ministry of Finance, Central Bank, Financial Service Authority, and Indonesia Deposit Insurance Corporation. So if you heard that one people/institution want to assume the financial system stability alone, there is no way that he/institution can do.

The Role of Central Bank
The practice of central bank may varies from country to country. Among others, it depends on whether the mandate of individual banking supervision and regulation still lay within the central bank
or not. It also depends on whether the rule of lender of last resort as well as the deposit insurance mechanism.

In some countries, the central bank still assume the mandate of individual banking supervision and also as the greater on financial system stability, but in other countries where the individual banking supervision is within FSA, there is a share responsibility in financial system stability. But in many countries and most countries, the central bank has a role as macro-prudential policy. Regardless, individual banking supervision within central bank or not. Pak Halim talking about what is macro-prudential policy, basically macro-prudential policy is regulation and supervision to financial institution from the macroeconomic perspective and focus on systemic risk. These are the two keys to understand: focus on macro perspective and systemic risk.

What is the meaning of macro perspective and systemic risk? Macro perspective meaning that we look into the function of financial system stability in intermediation in the economy. Both in the perspective of cross section and time dimension. On the time dimension, we can resort to the thinking on Ben Bernanke and Kyotaki and more about the financial acceleration hypothesis, the thinking goes beyond the initial thinking or original thinking of Hayman Minsky of financial system instability.

Basically, this is the nature of financial system stability. When the economic is booming, the financial cycle, which is Pak Halim talking about, is accelerating the economic cycle. When the economic growth, nominal GDP growth say about 13%, during the economic boom, the lending growth can accelerate to 20% why? Because there is thinking of external premium theory of Ben Bernanke. Or the valuation of the asset as underlying of the guarantee also increasing.

During the economic boom, the property price increase more than the inflation. So, as a collateral, those properties can be used to accelerate the lending. So, the lending growth, the valuation of the property are always accelerate as others. This is where financial accelerator hypothesis hold. This is what we are talking about time dimension of macro-prudential policy which
macro-prudential policy is the policy that can minimize the mitigating of procyclicality nature of the lending. How can we control the lending growth which too excessive in the boom aspect? How can we stimulate the ending growth during the recession? This is the instrument that we use loan to value ratio counter-cyclical buffer and other tools of macro-prudential to dampen the volatility of the procyclicality nature of financial cycle beyond the economic cycle. This is the first dimension of macro-prudential. This is by dissemination, regulation, supervision of financial system from the macro perspective.

How about focusing on risk of the system. This is where the area of interconnectedness of the financial system is very important. In the interbank market, counter-party in the financial system need to be regulated, controlled, structured in such a way to minimize the risk of the systemic in the financial system stability. This is the role of the central bank in those two aspects in managing the excessive lending, excessive external borrowing, mitigating the capital, flows management as well as in the interconnectedness of the financial system. Why the central bank as the institution that very important can take the role of macro prudential policy.

There are three reasons why central bank everywhere assume the responsibility of macro prudential policy. Since 1684, Bank of England being setup because the central banks everywhere since the beginning are providing as the lender of the last resort. This is the first reason for the central bank to hold the responsibility on macro prudential policy.

Secondly, macro prudential is talking about macro financial linkage, the role of financial system in intermediating the economy. This is where the expertise of central bank is kicked in. Everywhere, central bank in formulating monetary policy always looking into macro-economy aspect; forecasting analysis, growth, GDP growth, inflation, lending, current account deficit, macroeconomic aspect. You just need to add the financial sector in it. Then you have macro prudential aspect of the financial system stability. After all, macro prudential is about macro
financial linkage. The linkage between financial system and macro economy.

Third, the causes of financial system stability can arise from macroeconomic shocks; external borrowing, capital reversal, which is not under control of the FSA or other agency. Those factors causing financial system that are: external borrowing, capital reversal, some of the macroeconomic shocks are under control of the central bank. By adding macro prudential policy, it will more easy to assume the macro prudential stability to the central bank.

This is the second issue that I’m talking about the central bank everywhere regardless whether individual banking supervision are under the center bank or not. Everywhere, macro prudential policy are within center bank. Macro prudential is about rule and regulation of financial system from macro perspective and systemic risk because central bank assume as the lender of last resort and it has expertise in analyzing and forecasting the policy perspective of macro financial linkage. It is also because the central bank also use policy for controlling external borrowing, capital flows, and other aspect that causing financial system stability.

Marrying Monetary Policy and Macro Prudential Policy
This is the issue that Pak Halim talking about whether there is tradeoff between financial stability and price stability. The tradeoff maybe exist depending on where actually the economic states are lying, whether the forecasts of risk on the price stability are low or high. Whether the risk of financial stability are low or high, there is tradeoff inherent on the aspect, but this is doesn’t mean we can’t marry monetary policy and macro prudential policy. One of example: during the 2010-2013 there is a case in Indonesia that price stability is very low but accumulation of risk of financial stability are rising.

During the episode, inflation was very low, because of low inflation in domestically and appreciation of rupiah. On the other hand, risk of financial stability are rising because credit excessive
and the external borrowing are rising. So, there is inherent risk of financial system stability.

Besides the inflation targeting framework, there is other aspect of monetary policy: reserve requirement and capital flows restriction. In Indonesia we practice during the period to mitigate financial system stability. So, there is room to marry between monetary and macro prudential policy. Not through interest rate policy but with other aspect; reserve requirement and capital flows management. In this episode also there is room for macro prudential policy. This is the case where Indonesia issuing loan to value ratio. Those experience is refer to Pak Halim’s presentation about how to marry monetary and macro prudential policy. There is some tradeoffs but we can marry both instrument monetary and macro prudential policy.

I will close for two notes. The conceptual and experimental of the policy I think we are already progressing. But in practice, there are at least two challenges that we have to think about, both in theoretical as well as in policy making.

In theoretical, modeling of the policy of monetary and macro prudential is limited. How we design monetary and macro prudential to be optimal policy mixed. I think this is one area that academician can provide better perspective or some input on how we move forward in the financial stability and the role of the central bank in financial stability.

From practical perspective, the challenge is coming from on how we need to do a lot of simulation and mixing those policies and how we communicate better to the public in delivering the policy to support the financial system stability. This is the new breath of central bank’s role, which is not only achieving price stability but also promoting financial system stability in Indonesia and everywhere.

Thank you,
Jakarta, August 9, 2016.

**Perry Warjiyo**

*Deputy Governor Bank Indonesia*

*Chief Editor, Bulletin of Monetary Economics and Banking*
Very good morning about the noon ladies and gentlement. Pak Syahril, Pak Burhanudin, Ibu Miranda, Pak Perry Warjiyo, Pak Halim Alamsjah, our moderator Pak Edhie, and all participants of this great conferences, thank you for this opportunity. I will use my session to outline the budgeting process of the Indonesia government, specifically about the allocated budget and the link between the fiscal policy and financial stability.

Pak Halim already elaborated very nicely about the financial system stability framework, Pak Perry already elaborated about two important things, first, that financial stability cannot be done only by one institution only; and secondly, the roles of the Bank Central. Now let me start with the newly enacted law on the financial sector stability system.

The law has just been enacted last April. In that law, there is a committee, what we called the Financial System Stability
Committee, or the “Komite Stabilitas Sistem Keuangan”—KSSK. And the KSSK is chaired or coordinated by the Minister of Finance, and members are the Central Bank’s Governor and also the Head Commissioner of OJK as well as the LPS.

Four institutions, Ministry of Finance, Central Bank, Deposit Insurance, and also the Financial Service Supervision Authority, are really the four important pillars of the financial system stability in Indonesia. Different operational regulations are on their way, and we are preparing all of the necessary regulations at the Secretariat of the KSSK. I think it’s very important to note that our financial system stability law put a very big focus on the banking sector. Furthermore, the law emphasize heavily the bail-in principles, rather than the bail-out. And that is by choice or by design.

The decision has gone through long days and nights discussions by looking from our past experiences, as well as looking at some benchmarking to other countries. At the end of the day, that is the political approval. That is a political decision that is subject to further analysis. As an analyst everybody are very welcome to analyze the law.

To note, this law is a breakthrough of about seven years of deadlock. The government and the parliament last year, mid 2015, decided to start from scratch, drafting the law, and initiate the discussion with the parliament starting mid of 2015, culminated in the enactment in that law last April. I would like to invite researchers and also analyst to look at it, and to review it, and to tell us what we should watch furthermore, especially on the operational regulations of that law.

Series of socializations are underway and then I’m very proud to tell you as well that the law is actually a product of four institutions together with parliament. It is not only product of government and the parliament, because I’m very happy to see that my colleagues from Bank Indonesia as well as colleagues from the OJK as well as LPS, a very much involve in the formulation of that law. So it is a law that we produce together and it is the law that we going to use in times when it is indeed.
Hopefully, in many future volumes of the Bulletin of Monetary Economics and Banking, we will see some review about this. Hopefully ya Pak Erwin and also Pak Perry, we can look at this very carefully in the future. So there is number one.

**Fiscal Policy and Financial System Stability**

Previously Pak Halim explain the framework of financial stability, which include the fiscal policy. I would like to explain the 2016 Budget and to illustrate about the post in the budget that can link to the financial stability.

In revised budget 2016, the “APBN Revision 2016”, based on realization of the first semester, last June and the prognosis of semester II, the remaining of the year, we know the implementation of the budget is approaching 100 percent. On the revenue side, the realization is 1,786; semester I, 634, slightly below the realization of semester I last year, 667; but look at the prognosis of semester II, we must collect as much as 1,151. This is almost double the first semester, and one thing we know, the likelihood is very small.

So, right from the first number we know that how tough is the budget for the second semester. Of course, parts of the revenue, the biggest chance of the revenue is from the tax. First semester 552 trillion, and the second semester we have to collect 1,017 trillion. That is if we want 100 percent realization of the budget. And I can tell you that, never in the history of Indonesian fiscal policy that in one semester we collect 1,000 trillion. Last year, we collected 1,000 trillion rupiah. This year, first semester 552 and 1,017 trillion in the second semester is highly unlikely. This is really reflection of what our Minister, Ibu Sri Mulyani, mention earlier that the tax revenue target is somewhat ambitious. So this is really the number.

**The Risk**

Now, what are the risks? As we all may already have known or suspected, the tax officials will try their maximum effort to collect the tax. And then of course, given the economic cycle, our growth
start last year was 4.8. We do have quarter by quarter increase, starting the 3rd quarter last year, but we believe, the tax revenue of what we collected this year is somewhat a function of the activity last year.

Profit last year will impact what we are collecting today. The value added tax is a function of transaction. Yes, if the economic growth is the case, then the transaction will be bigger. Probably the value added tax is bigger. However, the recovery will be somewhere in the next three or four quarters, but most likely not now.

That is the very-short story on the revenue side. The second story is from the expenditure side. Expenditure, first semester realization is 865 trillion, which is 100 trillion more of what we achieve last year. The Central Government loan 481 trillion, compared to last year 417 trillion, or sixty-five trillion higher; somewhat a good story.

From January to June this year, the absorptions is higher compared to January to June last year. It is good to know that the personal expenditure is fine, though we have a little spike up due to the “gaji ke-13”, the thirteenth month salary, the “THR”.

On the other hand, the capital expenditure is very robust. From month after month the capital expenditure is increasing. Goods and services expenditure share similar pattern. Social assistant expenditure is also like that. The story so far is that good expenditure but weak revenue.

This situation will have impact to the surplus and deficits of government. Our deficit in June, is already 1.83 percent compared to last year 0.73 percent. And more importantly, is in this number, the realization of domestic financing, is already 100 percent. So, we start to see the link to the financial system because most of the financing is coming from the market. Although we do have financing from loans but the proportion is very small. This potentially can lead us cornered by the market.

This is the situation of the current budget. Probably what Bu Sri Mulyani mention to the media the other day, “tax revenue is ambitious” is one sentence. The picture of the real numbers are all public by now. You can analyze this numbers yourself. And we
are know this is the link to the financial system from our budget financing, which also comes from the financial market.

The Way Out
What should we do in this situation? Last week the Government decided that we had to have proper outlook of the budget without having to set a new posture. That is not saying we have to come up with the new APBN Revisions. Based on the law, when the government does not have enough cash, than the government can use the excess liquidity from last year, the SAL, “Sisa Anggaran Lebih”. The government can also expand the SBN issuance, which will go to the market. Lastly, the government can cut down his expenditures.

The last option allow us to cut down expenditures without having to request for the APBN Revisions. Since the numbers of the expenditures that we have in our budget is the maximum allocation, the government can decide to lower the absorption or lower the expenditures. This is what the government did in previous years.

Government decided that the tax would be shortfall about 218 trillion rupiah based on the government outlook by the end of the year. We are not creating a new posture. We are just calculate the half outlook of shortfall 218 trillion. By having that, we have to manage the expenditures.

The expenditure on the Central Government Line Ministry’s will be absorbed by 96 percent of the allocation. With Line Ministry’s of about 267, the four percent will leaving us a spare of around 30 trillion. The other source is cutting down the expenditures by 65 trillion, which has already been announced. Which mechanism is now being develop, you know, to translate it down to the different Line Ministry’s budget? Sixty five trillion all together, and the Transfers to the Region is cut down by about 68 trillion. To cut down the transfers to the Region by 68 trillion to, one can recalculate the revenue sharing. As usual, the revenue sharing that we put in the budget is prognosis. But in the fourth quarter, we will recalculated according to the actual numbers; actual oil lifting, actual tax, etc.
Number two, there are also ideas that Special Allocation Grant, the “Dana Alokasi Khusus”, can also be cut down because usually the absorption is lower than 100 percent. This includes the rural fund (dana desa), which we consider not absorbed about 3 trillion. This is absorption outlook.

All together there is also a discussion to discuss about General Allocation Fund, especially to region who has enough cash. Now, the total cash in hands by all local governments is no less than 200 trillion rupiah. Two hundred trillion rupiah cash in hands held by all local government in Indonesia.

We know several local governments are really cash rich. And we think that if we can manage a system together then their expenditures will not be, you know, suffered. But the Central Government may have enough leeway. In addition to that, our outlook of the deficits, is widen from 2.35 percent of the GDP to become 2.5 percent of the GDP. So, increasing about 0.15 percentage points of the GDP equivalent to about 17 trillion rupiah more financing, most likely from the market. The concern is how the points may link to the financial stability?

Money supply may have some effect to the financial stability. Last year, in December 2015, the amount of money in the hand of Local Governments in Indonesia is around 250 trillion. It happens to be that last December was series of “Pilkada” and many people becoming “Sinterklas”.

In December they spend money, reaching about 150 trillion. This number has a lot to do with the financial stability because in the first two weeks of January, banking sector were crying out loud. Their liquidity is drying. Why? Because this 150 trillion are taken out by the Local Governments, and they spend. One hundred fifty trillion over the total of about 4,000 trillion, just in one month is something.

We know that we must manage this problems to the future. Local Governments consist of about 500 local governments Individually they may not be large, but all together they are big entity. Now, by telling the Local Government that we will cut down the transfer, right from the mid of the year, we hope
this can adjust the behavior as well as the sudden impact or surprises to the banking sector.

And number three relates to the government deficits. We believe that increasing the government deficits to 2.5 percent of the GDP, or taking 17 trillion more from the market, is not going to make the market too jittery about Indonesia. We believe that by having this well spoken out will be better to manage the expectations rather than in November we just increase the deficits a little bit.

The last point that I would like to make is that in the financial stability mindset, it is very important to have a good communication. And this is actually what we are doing right now. The Government may have an option not to spell this out openly to the media, to the public, to the economy. But, we can just do it. We can cut down the expenditures. And I think, Ministry of Finance is very well known to have that very special ability to put marks or stars.

We can just cut down expenditures, and that is where a Ministry of Finance is famous about. Right now, we choose to communicate this and the Minister started that. We can go on with the numbers but we choose to open and to communicate this to the public because in our view, at the end of the day, financial stability is a matter of how we perceive the economy. The signal is very important. Yes, the data, the numbers, statistics will have to come through but then the way we communicate this to the public is one very good starting point to have a stability in our financial system.

Thank you very much, everyone.

Suhasil Nazara
Head of Fiscal Policy Agency
Ministry of Finance of the Republic Of Indonesia
Seminary Papers

G.C. Imanov, H.S. Alieva, R.A. Yusifzadeh
Azka Azifah Dienillah, Lukytawati Anggraeni, Sahara
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Achmad Noer Maulidi, Fathor Rozi
Syofia Dwi Jayanti
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Measuring Financial Stability In Azerbaijan

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This paper develops an aggregate financial stability index (AFSI) for Azerbaijan financial system, over the period 2005-2015. The main objective of the paper is to provide a new approach in calculation of the weights in aggregate index, which considered equally and determined by authors' judgment in a number of studies. For the purpose of construction aggregate index nineteen individual indicators were grouped into four composite indices (sub-indices). Then using intuitionistic fuzzy sets the weights of sub-indices and quality level of financial stability in Azerbaijan were defined for the period of 2005-2015. Main contribution of this research is determining the weights appropriately according to different years.

The outcome of the study shows that as compared to standard approach, fuzzy assessment of the index is more capable to capture a major periods of financial stability during the analyzed
period. Source of the data are World Bank (WB), International Monetary Fund (IMF) and Central Bank of the Republic of Azerbaijan (CBAR).

**Keywords:** financial stability, intuitionistic fuzzy sets, financial development index, financial vulnerability index, financial soundness index

**JEL Classification:** C43, C51, C53, E58

1. **INTRODUCTION**

Financial stability is a broad concept, included different aspects of financial system, such as institutions, infrastructure, and markets. This is an important phenomena in terms of the real economic growth. The financial system is stable only when it is able to promote the productivity of the economy and to prevent financial imbalances that arise endogenously or as a result of adverse and unforeseen events, Shinasi (2004).

Consequences of the financial and economic crises of the late XX and early XXI extended the necessity for researches on financial stability in central banks, financial institutions and independent experts at the national and international levels. The purpose of these researches was to develop appropriate approaches and evaluation methods for timely identification of sources of financial instability and to design a correct appropriate response to them. The major objective of analysis of financial stability is to examine the different relationships, detecting negative trends, as well as economic, regulatory and institutional determinants for assessing state of the financial system and its vulnerabilities.

Considering the financial stability of the system as a phenomenon within a particular state or region is commonly used a set of indicators that reflect the state of not only the financial sector institutions, infrastructure and the market in general, but also real, public, external sectors of the economy. So that it takes into account changes in the macroeconomic environment, which have a significant impact on the financial system.

From the international comparability of indicators have been developed guidelines for the compilation of financial
soundness indicators, by IMF and the monetary authorities of countries. Furthermore, the European Central Bank has developed a list of indicators for macro prudential monitoring financial stability of the European Union banking system.

In order to assess and monitor the financial stability for individual country an independent experts and the monetary authorities of the European Union have developed indicators taking into consideration the features of national economies (Gersl (2004) - National Bank of Czech Republic, Van den End (2005) - Central Bank of Netherlands, Rouabah (2007) - Central Bank of Luxembourg and etc.).

The aim of this research is to add new input to the financial stability literature by examining the case of emerging country like Azerbaijan. Specifically, the main objective of the paper is to provide a new approach in weighting procedure to estimate an aggregate financial stability index.

To the best of our knowledge the paucity of studies on financial stability index is very striking in the case of Azerbaijan. Moreover, this is the first attempt to fuzzy estimation of this index.

In this paper first on the base of yearly data for the period 2005-2015 were used standard method to estimate an aggregate index (AFSI) and corresponding composite indices, where the weights of sub-indices were taken equal to 0.25. Then to compute the weights we applied intuitionistic fuzzy sets, which allow to avoid subjectivity. However it is worth to note that fuzzy approach allow to acquire some advantages

The first advantage is that in a standard calculation of financial stability index, the value "0" indicates unstability and "1" recorded as a stability of the financial system. But fuzzy approach is convinient to avoid this kind of disjunction by determining a distributed terms such as "very low stability", "low stability" and etc. Second, diversified terms are obtained not only for aggregated index, but also for composite indices. This gives an opportunity to establish a stability level for sub-indices individually.

Moreover, in a large empirical literature the weights for individual indicators and for AFSI have assigned equally, but some
of them have been defined differently depending on the author's judgments. As mentioned in Albulescu (2004) latter requires complete data and it is difficult to justify and demonstrate the choice of the statistical weight. In our case we assumed an impact of individual indicators on financial stability equally, but composite indexes are weighted by intuitionistic fuzzy sets, which provide obtaining the different weights according to years. For the deepening of the research we are dealing with extention of the list of individual indicators and then to apply fuzzy approach to all indicators in order to obtain different weight for the individual indicators. This is the third advantage of using fuzzy approach.

The remainder of the paper is structured as follows. A brief literature reviewed in section two. Next we present methodology of the construction of the stability indices in the third section. Section four contains the calculation of an aggregate stability index for Azerbaijan financial system. The last section points out of the findings of this study.

2. LITERATURE REVIEW
Recent global financial crisis and changes in world economy have re-kindled the interest of central bankers and policy makers on the financial system stability assessment.

From the empirical prospects a large body of literature has applied various indexes in measurement of financial stability. Illing and Liu (2003) developed the Financial Stress Index (FSI) for Canada. In the study using daily data from the survey have been chosen variables reflecting banking sector, foreign exchange market and debt market. A standard method and credit weighting techniques were used for calculation.

Experts from Netherlands Central Bank Van den End (2006) created a Financial Condition Index (FCI) for Netherlands and six OECD countries. FCI index was built based on interest rates, effective exchange rate, real estate prices, stock prices, solvency of financial institutions and volatility of financial institutions stock index. Then the FCI index has been extended to Financial Stability Condition index (FSCI). Weighting of the
indicators have been employed by combining backward-looking IS curve and VAR (Vector Autoregressive Model).

In the paper for the Romanian financial system stability Albulescu (2009) developed a synthetic index in which aggregates different indicators for financial stability. For the purpose of constructing aggregate index based on quarterly data a twenty individual indicators were incorporated into four composite indices: (i) financial development index, (ii) financial vulnerability index, (iii) financial soundness index, (iv) world economic climate index. Aggregating of indicators employed by standard approach with equal weighting for individual indicators.

In the research developed by Morris (2010) for Jamaica applied normalization and aggregation procedures to create financial stability index. In their study weight of the sub-indices are determined by judgmental approach.

The next paper from a large literature on FSI assessment is Gersl and Hermanek (2006) aggregate index for the Czech Republic banking sector, which was called Banking Stability Aggregate Index (BSAI). The indicators were selected based on current international practice and weights established based on authors experience and judgments.

Nelson and Perli (2005) have constructed a Financial Fragility Index (FFI) for United States financial system in two-step process. First step involves three group indicators which take into consideration the level, volatility and correlation of twelve individual variables. Second step present logit model estimation to obtain the probability that the behavior of financial markets corresponds to previous financial crisis.

For the Azerbaijan there are a few papers developed for the financial stability assessment. One of them are employed by Yusifzade and Mammadova (2015). However in the paper is developed panel estimation for developing and developed countries, which aggregated data are obtained by using principle of components. The study captures four aspects of financial system as depth, access, efficiency and stability. Then aggregated index is used to estimate relationship between financial development and economic growth. According to panel estimation results show that
as financial stability reaches some intermediate level it starts to ensure economic development. However, economic development reverses if financial system is excessively stable and financial intermediaries keep more capital and liquidity than what is needed.

In the following section, we will describe construction method of financial stability index for Azerbaijan financial system, using standard procedure with fuzzy approach in weighting of sub-indices.

3. METHODOLOGY
The Construction Of The Stability Index For The Azerbaijan Financial System
Selection of indicators. In order to measure aggregated financial stability index where used following sub-groups’ indicators. Indicators of sub-indices of financial stability consist of the following:

The indicators of Financial Market Index - FMI
1. Total credit to GDP ratio (DC) - provides information about the ability of credit institutions in performing their intermediation functions. High value of this indicator increases the value of sub-index.

2. Interest Spread (IS) - defined as the difference between credit rates and deposits rates. The high spreads interpreted as incompetence of intermediation and allocation of resources, and low spreads are an indicator of the effectiveness of the banking system. High interest spreads have a negative impact on financial stability.

3. Herfindahl–Hirschman Index (HHI) in assets - demonstrates the concentration level of financial market. US Department of Justice considers markets with HHI value equal to less than 1,000-unconcentrated, 1000-800 - moderately, above 1000 - highly concentrated markets.

Market capitalization data was unavailable for analyzed period, thus we were satisfied with data represented above
The indicators of Financial Vulnerability Index - FVI

1. Fiscal deficit to GDP ratio (FD) - is taken as an indicator of financial system stress. High value of the indicator has a negative impact on economic development.

2. Current account (CA). The indicators of balance of payments allow to track up the coming external shocks. A significant deficit in current account may indicate to increasing possibility of a currency crisis and reducing the liquidity of the national financial system.

3. Inflation rate (IN) - rising inflation distorts price proportions and profitability indicators of economic processes, which leads to inefficient use of financial resources; deters the inflow of foreign investment; devalues national currency savings.

4. Real Effective Exchange Rate (REER) - this indicator reflects the exports competitiveness. The increase in this indicator expresses the competitiveness of the sector. High volatility negatively affects the financial system.

5. Public Debt to GDP ratio (PD) - a high level of this indicator negatively affects financial stability.

6. International Reserves to Import ratio (IR) - a sufficient level of international reserves allows the monetary authorities to conduct an independent and flexible monetary and currency policy by adjusting the level and volatility of the exchange rate of national currency and provide liquidity to the economic agents of financial markets in a stressful and crisis periods. High value of this indicator positively affects the financial system.

7. Non-government Credit to Total Credit ratio (NGC) - Reduction in the value of this indicator has a negative impact.

8. Ratio of M2 to International Reserves (MIR) - the increase adversely affects the adequacy of reserves.

9. M2 multiplier (MM) - High level of value has a negative influence to financial stability.
Indicators of Financial Soundness Index - FSI
1. Return on Assets (ROA) - High value refers to effectiveness of banking system.
2. Bank Capital to Assets Ratio (BCA) - increase in this indicator has a positive effect on performance of the banking system.
3. Liquid Assets to Total Assets ratio (LAA) - The growth indicates increasing liquidity, while reduction shows decline in the liquidity of banking sector.
4. Bank regulatory capital to risk weighted assets (RCRA) - the growth in the value of this indicator negatively affects banking system.

Indicators of World Economic Climate Index (WEI)
1. World Economic Growth (WEG) - Azerbaijan has new formulated financial system and growth in the global economy positively impact on financial system of country
2. Oil Price in the world market (OPR)[9] - due to Azerbaijan is resource rich country and economy more supported by oil revenues, rise in oil prices has a positive effect in the economy as a whole.

All financial systems are interconnected and deterioration of these indicators such as, world economic growth, world inflation and oil prices has negative impact at national level for economic and financial stability, Albulescu (2010).

Standard Approach of Measuring Aggregated Financial Stability Index
To identify the in direct effects of growth on poverty reduction through labor market and local redistribution mediation models are applied. A variable is regarded a mediator when it transmits the impact of independent variable (X) on dependent variable (Y). It is assumed the mediation effect occurs when: 1) the variable X influences mediator significantly; 2) the variable X influences the Y in the absence of the mediator; 3) the mediator influences Y
significantly; and 4) the influence of the X on the Y shrinks upon the addition of the mediator to the model.

The research uses Sobel, Aroian and Goodman tests. The tests are applied to evaluate mediation effects of labor-market variables. It means the following hypotheses are verified: The indirect impact of real GDP on poverty (Watts index) - via, for example: employment in sections/wages in these sections - is significantly different from zero. The values of parameters used in the mediation tests are estimated in the panel data models.

**Fuzzy Approach to Measuring Financial Stability Index**

Measurement performs two quite distinct roles. One is to help ensure the accountability of the authorities responsible for performing the task. The other is to support the implementation of the chosen strategy to achieve the goal in the real time. The former calls for ex post measurement of financial instability, i.e. for assessments of whether financial instability prevailed or not at some point in the past. The latter relies on ex ante measurement, i.e. on assessment of whether the financial system is fragile or not today. While both ex ante and ex post measurement are “fuzzy”, the challenges in supporting strategy implementation are tougher (Borio and Drehmann (2009).

The literature mentions several methods for determining the weights of the variables in the FSI. These are econometric estimations with a macroeconomic model, a reduced form aggregate demand function (backward-looking IS curve), or a Vector Autoregression Model (VAR). The weights can also be determined by the way of economic arguments, such as a variable’s importance for the financial system. Alternatively, each variable in the index can be given in equal weights. In some studies, the above methods are combined (Van den End, 2006).

In determining the weights of sub-indices are mainly used expert assessments. However, it should be noted that the values of these weights depend not only on time but also on situation existing in the various financial markets and global economy. In
order to define the weights of individual sub-indices of an aggregated index, we have used intuitionistic fuzzy set technique.

The intuitionistic fuzzy set, proposed by K. Atanassov (1986), is a generalization of L. Zadeh's fuzzy set. The intuitionistic fuzzy set is defined as:

\[ A = \{ x, \mu_A(x), \nu_A(x) > |x \in X\}, \]

where,

\[ \mu_A : X \to [0,1], \nu_A : X \to [0,1] \]

\[ 0 \leq \mu_A(x) + \nu_A(x) \leq 1 \quad \forall x \in X \]

\[ \mu_A(x), \nu_A(x) \in [0,1] \]

Numbers indicate the degree of membership and non-membership of \( x \) to \( A \), respectively. For each intuitionistic fuzzy set \( X \), there is an intuitionistic index \( \pi_A(x) = 1 - \mu_A(x) \) for \( \nu_A(x) \).

In this study, in order to define weights of financial stability sub-indices, we have used a generalized entropy measure of intuitionistic fuzzy set \( F \), composed of \( n \) elements, proposed by E. Szmidt and J. Kacprzyk (2001):

\[ E(F) = \frac{1}{n} \sum_{i=1}^{n} \left( \frac{\max \text{Count} (F_i \cap F^c_i)}{\max \text{Count} (F_i \cup F^c_i)} \right), \]

where,

\[ F_i \cap F^c_i = (\min(\mu_{F_i}, \mu_{F^c_i}), \max(\nu_{F_i}, \nu_{F^c_i})), \]

\[ F_i \cup F^c_i = (\min(\mu_{F_i}, \mu_{F^c_i}), \max(\nu_{F_i}, \nu_{F^c_i})). \]

The weights of each individual index are defined on the basis of the following formula:

\[ w_i = \frac{1 - E(A_i)}{n - \sum_{i=1}^{n} E(A_i)} \]

### 4. RESULTS AND ANALYSIS

**Standard procedure of measuring AFSI**

According to standard method of calculation an aggregate financial stability index in the first step individual indicators have been normalized. Table 1 shows the normalized value of indicators for 2005-2015 years.
Table 1. Normalized values of the indicators of financial stability in Azerbaijan during 2005-2015

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<td>-0.9</td>
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<td>-1.27</td>
<td>-1.05</td>
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<td>-6.69</td>
<td>0.24</td>
<td>1.23</td>
<td>1.36</td>
<td>0.81</td>
<td>-0.98</td>
<td>-0.75</td>
<td>-1.04</td>
<td>-1.12</td>
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<td>1.21</td>
<td>-0.76</td>
<td>0.08</td>
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<td>1.36</td>
<td>0.40</td>
<td>0.86</td>
<td>0.64</td>
<td>0.21</td>
<td>-0.15</td>
<td>-0.5</td>
<td>-1.76</td>
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<td>0.53</td>
<td>0.86</td>
<td>0.66</td>
<td>0.72</td>
<td>1.48</td>
<td>-0.35</td>
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<td>PD</td>
<td>0.76</td>
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<td>-1.20</td>
<td>-1.72</td>
<td>0.14</td>
<td>-0.15</td>
<td>-0.56</td>
<td>0.06</td>
<td>0.96</td>
<td>1.83</td>
<td>0.39</td>
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<tr>
<td>IR</td>
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<td>-1.29</td>
<td>-0.50</td>
<td>-0.15</td>
<td>-0.19</td>
<td>0.221</td>
<td>0.43</td>
<td>0.67</td>
<td>1.32</td>
<td>1.59</td>
<td>-0.40</td>
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<td>NGC</td>
<td>-1.45</td>
<td>-0.24</td>
<td>0.28</td>
<td>-0.32</td>
<td>-1.31</td>
<td>-0.94</td>
<td>-0.07</td>
<td>0.26</td>
<td>1.28</td>
<td>1.57</td>
<td>0.93</td>
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<td>MFR</td>
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<td>-0.73</td>
<td>-0.50</td>
<td>-0.78</td>
<td>0.42</td>
<td>0.95</td>
<td>-0.25</td>
<td>0.48</td>
<td>0.39</td>
<td>0.96</td>
<td>1.21</td>
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<td>-0.35</td>
<td>-0.35</td>
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<td>0.92</td>
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<td>ROA</td>
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<td>-0.09</td>
<td>0.99</td>
<td>0.45</td>
<td>0.86</td>
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<td>-1.03</td>
<td>-1.43</td>
<td>-0.49</td>
<td>-0.22</td>
<td>1.80</td>
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<tr>
<td>BCA</td>
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<td>0.02</td>
<td>0.24</td>
<td>0.46</td>
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<td>0.24</td>
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<td>-0.35</td>
<td>0.46</td>
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<td>LAA</td>
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<td>1.86</td>
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<td>-0.33</td>
<td>-0.85</td>
<td>-0.10</td>
<td>-0.18</td>
<td>0.08</td>
<td>-0.85</td>
<td>-0.53</td>
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<td>RCRA</td>
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<td>0.49</td>
<td>1.12</td>
<td>-0.02</td>
<td>0.03</td>
<td>-0.44</td>
<td>-1.58</td>
<td>-0.44</td>
<td>0.18</td>
<td>0.75</td>
<td>-1.63</td>
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**World Economic Index**

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<tr>
<td>WEG</td>
<td>0.67</td>
<td>1.02</td>
<td>0.96</td>
<td>-0.27</td>
<td>-2.54</td>
<td>0.90</td>
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<td>-0.21</td>
<td>-0.15</td>
<td>-0.27</td>
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<td>OPR</td>
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<td>-0.76</td>
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<td>0.77</td>
<td>-0.88</td>
<td>-0.07</td>
<td>1.10</td>
<td>1.14</td>
<td>1.10</td>
<td>0.73</td>
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<td>ECI</td>
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<td>1.14</td>
<td>0.73</td>
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<td>0.02</td>
<td>0.58</td>
<td>-0.95</td>
<td>-0.67</td>
<td>0.58</td>
<td>0.30</td>
<td>-0.11</td>
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**Table 2. Sub-indices and aggregate index of financial stability of Azerbaijan during 2005-2015**

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<tbody>
<tr>
<td>FMI</td>
<td>-2.06</td>
<td>-2.33</td>
<td>-0.05</td>
<td>0.53</td>
<td>0.53</td>
<td>-0.01</td>
<td>-0.82</td>
<td>-0.58</td>
<td>-0.58</td>
<td>0.06</td>
<td>0.85</td>
</tr>
<tr>
<td>FVI</td>
<td>-1.13</td>
<td>-0.38</td>
<td>-0.01</td>
<td>0.10</td>
<td>-0.33</td>
<td>-0.06</td>
<td>0.22</td>
<td>0.19</td>
<td>0.66</td>
<td>0.83</td>
<td>-0.08</td>
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<tr>
<td>FSI</td>
<td>1.18</td>
<td>0.57</td>
<td>0.54</td>
<td>0.14</td>
<td>0.23</td>
<td>-0.36</td>
<td>-0.84</td>
<td>-0.53</td>
<td>-0.17</td>
<td>0.10</td>
<td>-0.85</td>
</tr>
<tr>
<td>WEI</td>
<td>0.04</td>
<td>0.47</td>
<td>0.41</td>
<td>-0.62</td>
<td>-1.13</td>
<td>0.47</td>
<td>0.10</td>
<td>0.07</td>
<td>0.49</td>
<td>0.29</td>
<td>-0.59</td>
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<tr>
<td>AFSI</td>
<td>-0.49</td>
<td>-0.42</td>
<td>0.22</td>
<td>0.04</td>
<td>-0.18</td>
<td>0.01</td>
<td>-0.34</td>
<td>-0.21</td>
<td>0.10</td>
<td>0.32</td>
<td>-0.17</td>
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</table>
The results of calculation for sub-indices and aggregate index of Azerbaijan during 2005-2015 are given in Table 2 and Figure 1. We have assumed each of the sub-indices have received the weights equal to 0.25.

Conforming to standard method the outcome describes that AFSI has not received the value "1" during 2005-2015 period, which means that financial system Azerbaijan has not been stable during this term. This results leave in doubt, because after 2006 years country lives an oil boom period where banking sector performance was satisfying according to data.

4.2. Fuzzy approach to measuring AFSI

Supposing the same weights we are not able to examine the changes in the economy each year. Fuzzy approach is competent to close this gap.

In a fuzzy approach to aggregate index of financial stability the obtained values of sub-indices for 2005-2015 years are classified into (i) Very low stability – VLS = (-2.43, -2.43, -1.20); (ii) Low stability – LS = (-1.23,0.00,0.00); (iii) Stable – S = (0.00,0.00, 0.65); and (iv) High stability – HS = (0.63; 1.28; 1.28).
The matrix of linguistic variables for the years of 2005-2015 is given in Table 3.

**Table 3. Matrix of linguistic values of sub-indices in the period 2005-2015**

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<tr>
<td>FMI</td>
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<td>ST</td>
<td>LS</td>
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<td>ST</td>
<td>ST</td>
<td>HS</td>
<td>HS</td>
<td>LS</td>
<td></td>
</tr>
<tr>
<td>FSI</td>
<td>HS</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>LS</td>
<td>LS</td>
<td>LS</td>
<td>ST</td>
<td>LS</td>
<td></td>
</tr>
<tr>
<td>WEI</td>
<td>ST</td>
<td>ST</td>
<td>LS</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>LS</td>
<td></td>
</tr>
</tbody>
</table>

Indicators of financial stability sub-indices of Azerbaijan for 2005-2015 years, corresponding to indicators of intuitionistic fuzzy set, are given in following Table 4:

**Table 4. Indicators of intuitionistic fuzzy set**

<table>
<thead>
<tr>
<th>Sub-indices</th>
<th>FMI</th>
<th>FVI</th>
<th>FSI</th>
<th>WEI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\mu_{at}$</td>
<td>$\nu_{at}$</td>
<td>$\pi_{at}$</td>
<td>$\mu_{at}$</td>
</tr>
<tr>
<td>2005</td>
<td>0.70</td>
<td>0.30</td>
<td>0</td>
<td>0.08</td>
</tr>
<tr>
<td>2006</td>
<td>0.92</td>
<td>0.08</td>
<td>0</td>
<td>0.69</td>
</tr>
<tr>
<td>2007</td>
<td>0.96</td>
<td>0.04</td>
<td>0</td>
<td>0.99</td>
</tr>
<tr>
<td>2008</td>
<td>0.18</td>
<td>0.82</td>
<td>0</td>
<td>0.85</td>
</tr>
<tr>
<td>2009</td>
<td>0.20</td>
<td>0.80</td>
<td>0</td>
<td>0.73</td>
</tr>
<tr>
<td>2010</td>
<td>0.99</td>
<td>0.01</td>
<td>0</td>
<td>0.95</td>
</tr>
<tr>
<td>2011</td>
<td>0.33</td>
<td>0.67</td>
<td>0</td>
<td>0.66</td>
</tr>
<tr>
<td>2012</td>
<td>0.53</td>
<td>0.47</td>
<td>0</td>
<td>0.70</td>
</tr>
<tr>
<td>2013</td>
<td>0.53</td>
<td>0.47</td>
<td>0</td>
<td>0.04</td>
</tr>
<tr>
<td>2014</td>
<td>0.89</td>
<td>0.11</td>
<td>0</td>
<td>0.31</td>
</tr>
<tr>
<td>2015</td>
<td>0.35</td>
<td>0.65</td>
<td>0</td>
<td>0.93</td>
</tr>
</tbody>
</table>

The calculation of entropy for each individual sub-indices during the year of 2005 is given below:

\[
E(A_1) = \frac{(0.35,0.65,0) \cap (0.65,0.35,0)}{(0.35,0.65,0) \cup (0.65,0.35,0)} = \frac{0.35}{0.65} = 0.54
\]
\[
E(A_2) = \frac{(0.93,0.07,0) \cap (0.07,0.93,0)}{(0.93,0.07,0) \cup (0.07,0.93,0)} = \frac{0.07}{0.93} = 0.08
\]
\[
E(A_3) = \frac{(0.3,0.7,0) \cap (0.7,0.3,0)}{(0.3,0.7,0) \cup (0.7,0.3,0)} = \frac{0.3}{0.7} = 0.43
\]
\[
E(A_4) = \frac{(0.52,0.48,0) \cap (0.48,0.52,0)}{(0.52,0.48,0) \cup (0.48,0.52,0)} = \frac{0.48}{0.52} = 0.92
\]

The entropy for each individual sub-index in 2005-2014 is as:

2005 - $E(A_1) = 0.43$; $E(A_2) = 0.09$; $E(A_3) = 0.18$; $E(A_4) = 0.06$

2006 - $E(A_1) = 0.09$; $E(A_2) = 0.45$; $E(A_3) = 0.14$; $E(A_4) = 0.39$
2007 - $E(A_1) = 0.04$; $E(A_2) = 0.01$; $E(A_3) = 0.19$; $E(A_4) = 0.56$
2008 - $E(A_1) = 0.22$; $E(A_2) = 0.18$; $E(A_3) = 0.28$; $E(A_4) = 1$
2009 - $E(A_1) = 0.25$; $E(A_2) = 0.37$; $E(A_3) = 0.56$; $E(A_4) = 0.09$
2010 - $E(A_1) = 0.01$; $E(A_2) = 0.05$; $E(A_3) = 0.43$; $E(A_4) = 0.37$
2011 - $E(A_1) = 0.49$; $E(A_2) = 0.52$; $E(A_3) = 0.47$; $E(A_4) = 0.18$
2012 - $E(A_1) = 0.89$; $E(A_2) = 0.43$; $E(A_3) = 0.75$; $E(A_4) = 0.12$
2013 - $E(A_1) = 0.89$; $E(A_2) = 0.04$; $E(A_3) = 0.16$; $E(A_4) = 0.32$
2014 - $E(A_1) = 0.12$; $E(A_2) = 0.45$; $E(A_3) = 0.18$; $E(A_4) = 0.85$

The weights of individual sub-indices for the year of 2015 are calculated as follows:

$$w_1(2015) = \frac{1 - 0.54}{4 - 1.97} = \frac{0.46}{2.03} = 0.23$$
$$w_2(2015) = \frac{1 - 0.08}{4 - 1.97} = \frac{0.92}{2.03} = 0.45$$
$$w_3(2015) = \frac{1 - 0.43}{4 - 1.97} = \frac{0.57}{2.03} = 0.28$$
$$w_4(2015) = \frac{1 - 0.92}{4 - 1.97} = \frac{0.08}{2.03} = 0.04$$

Using weights of individual sub-indices and their linguistic values (Table 3), aggregated index of financial stability is calculated for the year of 2015:

$$AFSI(2015) = 0.23 \times HS + 0.45 \times LS + 0.28 \times LS + 0.04 \times LS$$
$$= 0.23 \times (0.63, 1.28, 1.28) + 0.45 \times (-1.23, 0, 0) + 0.28 \times (-1.23, 0, 0)$$
$$+ 0.04 \times (-1.23, 0, 0)$$
$$= (0.15, 0.29, 0.29) + (-0.55, 0, 0) + (-0.34, 0, 0)$$
$$+ (-0.05, 0, 0) = (-0.79, 0.29, 0.29) = LS - ST$$

The weights of sub-indices and aggregated index of financial stability for the period 2005-2015 are given in Table 5. The results of calculations for weights of sub-indices and aggregated indices of financial stability during the period 2005-2015.
Table 5. Weights of Sub-indices and Aggregated Indices

<table>
<thead>
<tr>
<th>Years</th>
<th>$w_1$</th>
<th>$w_2$</th>
<th>$w_3$</th>
<th>$w_4$</th>
<th>AFSI</th>
<th>Stability Cat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>0.18</td>
<td>0.25</td>
<td>0.28</td>
<td>0.29</td>
<td>(-0.57,-0.08,0.33)</td>
<td>LS – ST</td>
</tr>
<tr>
<td>2006</td>
<td>0.31</td>
<td>0.19</td>
<td>0.29</td>
<td>0.21</td>
<td>(-0.98,-0.75,-0.04)</td>
<td>LS</td>
</tr>
<tr>
<td>2007</td>
<td>0.3</td>
<td>0.31</td>
<td>0.25</td>
<td>0.14</td>
<td>(-0.75,0,0251)</td>
<td>LS- ST</td>
</tr>
<tr>
<td>2008</td>
<td>0.34</td>
<td>0.35</td>
<td>0.31</td>
<td>0</td>
<td>(0,0,0.65)</td>
<td>ST</td>
</tr>
<tr>
<td>2009</td>
<td>0.28</td>
<td>0.23</td>
<td>0.16</td>
<td>0.33</td>
<td>(-0.69,0,0.228)</td>
<td>LS - ST</td>
</tr>
<tr>
<td>2010</td>
<td>0.32</td>
<td>0.3</td>
<td>0.18</td>
<td>0.2</td>
<td>(-1,0,0.13)</td>
<td>LS - ST</td>
</tr>
<tr>
<td>2011</td>
<td>0.22</td>
<td>0.21</td>
<td>0.23</td>
<td>0.35</td>
<td>(-0.55,0,0.37)</td>
<td>LS - ST</td>
</tr>
<tr>
<td>2012</td>
<td>0.06</td>
<td>0.32</td>
<td>0.14</td>
<td>0.49</td>
<td>(-0.24,0,0.53)</td>
<td>LS - ST</td>
</tr>
<tr>
<td>2013</td>
<td>0.04</td>
<td>0.37</td>
<td>0.32</td>
<td>0.26</td>
<td>(-0.2,0.47,0.64)</td>
<td>LS - ST</td>
</tr>
<tr>
<td>2014</td>
<td>0.37</td>
<td>0.23</td>
<td>0.34</td>
<td>0.06</td>
<td>(0.15,0.29,0.79)</td>
<td>ST - HS</td>
</tr>
<tr>
<td>2015</td>
<td>0.23</td>
<td>0.45</td>
<td>0.28</td>
<td>0.04</td>
<td>(-0.79,0.29,0.29)</td>
<td>LS - ST</td>
</tr>
</tbody>
</table>

Comparing two approaches with respect to development of AFSI a fuzzy approach is satisfactory than standard method, because this approach are captured changes in economy. Considering the fact that Azerbaijan is transition country with new financial system, results are generally represent low stability during 2005-2007 and 2009-2013 periods.

Aggregate index is higher in 2008 and 2014 which reflects the higher stability of financial system. The reason for this was the economic growth supported by oil, which stimulated banking sector. With respect to "Contract of the Century, 1994" economy is gifted from oil revenues and 2007 year was an oil boom period for the country, where oil revenues contributed to economy and financial system. As a result of global economic crises since 2009, the stability decreased to low stable level. Then since 2010 economy is in recovery stage and increasing of oil prices committed to higher stability performed in 2014. However, oil price declining at the end of 2014 and devaluation of exchange rate in 2015 affected banking sector activity and performance. It resulted with a low stable level of financial stability.
4. CONCLUSION
This paper developed method for calculation of the weights of composite indices and quality level of financial stability in Azerbaijan for the period of 2005-2015.

Main contribution was determining the weights appropriately for the years. It is worth to note that implementation equal weights to the aggregate index is not capable to cover the economic changes in 2005-2015. Fuzzy approach allows to obtain weights represented for the years separately. Moreover this approach made possible to avoid disjunction of the phenomena such as "stability" and "unstability" by determining "very low stability", "low stability" and etc. terms.

However, results of fuzzy approach are more acceptable than standard methods because these are able to capture key periods of financial stability during the sample period. For the future to enhance of the outcomes and for deepening of the research our main goal is to extend the list of individual indicators and then apply fuzzy approach to obtain different weights for all individual indicators.

REFERENCES


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Financial Inclusion

Impact on Financial Stability across Group Countries

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Departement of Economics, Faculty of Economics and Management, Bogor Agricultural University
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Complete version will be published on forthcoming issue on Bulletin of Monetary Economics and Banking

Abstract

Financial inclusion is one of strategy to increase inclusive growth in many countries. However it may cause either stability or instability in the financial system and the impact can be different among income group countries. Potential instability in the financial system occurs when financial inclusion causes reducting in credit standard, increasing risk of bank reputation, and uncoresponding regulation in microfinance.

This research aimed to measure financial inclusion and financial stability indexes between countries and analyze the impact of financial inclusion on financial stability in 19 countries based on income group from 2004-2011. Data were collected from World Bank, the International Monetary Fund (IMF)
database, and other sources. The methods used Sarma index to calculate financial inclusion, Albulescu and Goyeau index to calculate financial stability, and tobit model to analyze the impact of financial inclusion on financial stability.

The results show higher income countries have higher financial inclusion and financial stability index than lower income countries. Financial inclusion only has positive significant effect to financial stability in high income countries. Lower and upper middle income countries have to increase availability of financial services to enhance financial inclusion. Moreover, lower and upper middle income countries have to increase financial development to enhance financial stability.

Keywords: financial inclusion index, financial stability index, tobit model

JEL Classification: C5, E6, C1

1. INTRODUCTION

Financial inclusion becomes an important program at national and international level because there are 2.6 billion people or more than 50% of world population not having access to credit, insurance, and savings (CGAP 2013). Financial inclusion program is expected to increase inclusive growth in many countries. Increasing in financial inclusion enhances based deposit as source of credit. The credit can improve real sector performance. These will reduce poverty, improve income distribution, and improve the stability of the financial system in order to achieve growth that is felt by the entire community (Khan 2011).

Seriousness of the international communities in implementing the program of financial inclusion can be seen from increasing of formal financial services products. In Figure 1 below shows an average increase of outstanding loans from 2004 to 2011. Upper middle income countries group has the highest average growth of outstanding loans, the percentage of outstanding loans growth in Upper middle income countries
group is 13.3%. Lower middle income countries group has negative growth of loans per 1000 adult population. The growth rate of lower middle income countries group is -8.3%. Average world has positive credit accounts per 1000 adult population growth rate amount of 8.1%.

There are few studies about the impact of financial inclusion on financial stability with different result. Some studies about the impact of financial inclusion on financial stability which show the positive impact was conducted by Dienillah (2015), Morgan and Pontines (2014), Cull et al. (2012), and Huang and Rakovski (2011). Furthermore, some studies which show potential negative impact of financial inclusion on financial stability undertaken by Dupas et al. (2012) and Khan (2011). Since there are different result of the impact of financial inclusion on financial stability, we need more research about this topic.

In the theory, high level of financial inclusion will be followed by strong financial system. In addition, people with lower income level should have a better impact of financial inclusion on financial stability than people with higher income (CGAP 2013). This is because people with higher income have a faster response when the crisis happen than people with lower income. The response can be seen from the massive withdrawal of higher-income customers when a crisis occurs. However, from some studies and fact haven’t confirmed these theory so further research is needed.

Han and Melecky (2013) state that financial inclusion has a positive impact on financial stability in high income countries and upper middle income countries. This is because increasing in financial inclusion can improve deposits in commercial bank so it will make resilience of the funding base of deposits in banking sector when crisis occurs. In contrast to high-income countries group and upper middle income group, the lower middle income countries group has the potential instability in financial system due to financial inclusion (Khan 2011).
In previous studies about the impact of financial inclusion on financial stability still use a proxy to represent the level of financial inclusion and a level of financial stability. Morgan and pontines (2014) suggest to include other variables in describing financial inclusion and financial stability since financial inclusion is not only seen by financial products indicator such as SMEs outstanding loans but also seen by penetration and product access to formal financial institutions indicators (Sarma 2008). The stability of the financial system is not only seen by Bank Z score because the financial system is not only influenced by the banking sector, but also influenced by the state of real economy, households, corporations, external factors, and so on. So it is necessary to build a more representative index describes the financial inclusion and stability of financial system. Therefore, this research raise the question on how is the financial inclusion among countries based on income group countries in 2004-2011.

2. METHODOLOGY

Types and Sources of Data

The data used is secondary data which is an annual data with an unbalanced panel data structure. The panel data consist of a cross section data including lower middle-income countries group (Egypt, El salvador, India, Indonesia, and Nigeria), upper middle-income countries group (Argentina, Bosnia, Chile, Colombia, Macedonia, Malaysia, Mexico, Namibia, and Thailand), and high-income countries group (Belgium, Czech, Hungary, Korea, and Switzerland). Time series data from 2004 to 2011. The data were collected from various sources such as: World Bank, World Development Indicators (WDI), International Monetary Fund (IMF) database, and other sources. This research was conducted with software such as STATA and Microsoft Excel.
Table 1. Data, Unit, and Sources

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Unit</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Stability Index</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Development Index (FDI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market capitalization /GDP</td>
<td>(%)</td>
<td>IFS IMF</td>
</tr>
<tr>
<td>National Currency Credit/GPD</td>
<td>(%)</td>
<td>world Bank</td>
</tr>
<tr>
<td>Interest rate spread</td>
<td>(%)</td>
<td>world Bank</td>
</tr>
<tr>
<td>Bank concentration</td>
<td>(%)</td>
<td>world Bank</td>
</tr>
<tr>
<td>Financial Vulnerability Index (FVI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflation, consumer prices</td>
<td>(%)</td>
<td>IFS IMF</td>
</tr>
<tr>
<td>General Balance, Deficit or Surplus/GDP</td>
<td>(%)</td>
<td>world Bank</td>
</tr>
<tr>
<td>Current Account / GDP</td>
<td>(%)</td>
<td>world Bank</td>
</tr>
<tr>
<td>Real Effective Exchange Rate (change)</td>
<td>(%)</td>
<td>world Bank</td>
</tr>
<tr>
<td>Non Governtmental Kredit / Total Kredit</td>
<td>(%)</td>
<td>world Bank</td>
</tr>
<tr>
<td>Loan / Deposits</td>
<td>(%)</td>
<td>world Bank</td>
</tr>
<tr>
<td>Deposit / M2</td>
<td>(%)</td>
<td>world Bank</td>
</tr>
<tr>
<td>Financial Soundness Index (FSI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bank nonperforming loans to gross loans</td>
<td>(%)</td>
<td>world Bank</td>
</tr>
<tr>
<td>Bank capital to total assets</td>
<td>(%)</td>
<td>world Bank</td>
</tr>
<tr>
<td>Bank Return on Asset (ROA)</td>
<td>(%)</td>
<td>world Bank</td>
</tr>
<tr>
<td>Bank Z-score</td>
<td>(%)</td>
<td>world Bank</td>
</tr>
<tr>
<td>World Economic Climate Index</td>
<td></td>
<td></td>
</tr>
<tr>
<td>World Inflation, consumer prices</td>
<td>(%)</td>
<td>IFS IMF</td>
</tr>
<tr>
<td>World GDP growth</td>
<td>(%)</td>
<td>IFS IMF</td>
</tr>
<tr>
<td>Economic Climate Index</td>
<td>Index</td>
<td>CESifo</td>
</tr>
<tr>
<td>Financial Inclusion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penetration (Number of Bank Accounts per 1000 adults)</td>
<td>Index</td>
<td>IMF</td>
</tr>
<tr>
<td>Availability (Number of Bank branches per 100,000 adults)</td>
<td>Index</td>
<td>IMF</td>
</tr>
<tr>
<td>Usability (Outstanding Loans as percent of GDP)</td>
<td>(%)</td>
<td>IMF</td>
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<tr>
<td>Usability (Outstanding Deposits as percent of GDP)</td>
<td>(%)</td>
<td>World bank</td>
</tr>
<tr>
<td>Other Factors</td>
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<td></td>
</tr>
<tr>
<td>Non-performing loan to gross deposit</td>
<td>(%)</td>
<td>World Bank</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>USD /person</td>
<td>World Bank</td>
</tr>
<tr>
<td>private credit by deposit money</td>
<td>(%)</td>
<td>World Bank</td>
</tr>
<tr>
<td>Indicator</td>
<td>Unit</td>
<td>Source</td>
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<tr>
<td>-----------------------------------------------</td>
<td>--------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>banks and other financial institutions to GDP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>non-FDI capital flow to GDP</td>
<td>Index</td>
<td>World Bank</td>
</tr>
<tr>
<td>Financial Openness</td>
<td>Index</td>
<td>Chinn-Ito database</td>
</tr>
<tr>
<td>liquid assets to deposits and short-term funding</td>
<td>(%)</td>
<td>World Bank</td>
</tr>
</tbody>
</table>

**Financial Inclusion Index**

Calculation of Financial Inclusion index in this research uses a method developed by Sarma (2008). There are three dimensions in this calculation such as banking penetration (Number of deposit accounts at commercial bank per 1000 adult population), the availability of banking services (number of branches of commercial bank per 100 000 population) and usability (the proportion of loans and deposit to GDP). These are the steps of calculation:

1. Calculating the value of the indicator on each dimension that has been weighted.

   \[ d_i = w_i \frac{A_i - m_i}{M_i - m_i} \]

   Where \( w_i \) = weight for dimension \( i \), \( 0 \leq w_i \leq 1 \); \( A_i \) = Current value of the variable \( i \); \( m_i \) = minimum value of the variable \( i \); \( M_i \) = maximum value of the variable \( i \).

2. Calculating the value of \( X_1 \) and \( X_2 \)

   \[ X_1 = \sqrt{\frac{d_1^2 + d_2^2 + d_3^2}{w_1^2 + w_2^2 + w_3^2}} \]

   \[ X_2 = 1 - \sqrt{\frac{(w_1 - d_1)^2 + (w_2 - d_2)^2 + (w_3 - d_3)^2}{w_1^2 + w_2^2 + w_3^2}} \]

3. Calculating the value of the Financial Inclusion Index =
\[ \frac{1}{2} [X_1 + X_2] \]

Range of financial inclusion index is between 0 until 1. Country category based on financial inclusion index value is (i) low level of financial inclusion for Index < 0.3; (ii) moderate level of financial inclusion for 0.3 ≤ index < 0.6; and good level of financial inclusion for 0.6 ≤ index.

**Financial System Stability Index**

Calculation of financial stability index in this study uses a method developed by Albulescu and Goyeau (2010). There are 18 indicators in this calculation. These indicators represent some of the sub-indexes making up the index of financial stability. The constituent sub-indexes include the Financial Development Index, Financial Vulnerability Index, Financial Soundness Index, and the World Economic Climate Index. Steps of financial stability index calculation are as follow:

1. Normalizing each indicator value with the following formula:

\[ I_{itn} = \frac{I_{it} - \text{Min}(I_i)}{\text{Max}(I_i) - \text{Min}(I_i)} \]

Where: \( I_{itn} \) = value of variable that has been normalized; \( I_{it} \) = current value of \( i \) variable; \( \text{Min}(I_i) \) = minimum value of \( i \) variable; and \( \text{Max}(I_i) \) = maximum value of \( i \) variable.

2. Calculating sub-indexes of financial stability index.

\[ \overline{D}_t = \frac{\sum_{i=1}^{4} D_{it}}{4}; \overline{V}_t = \frac{\sum_{i=1}^{8} V_{it}}{7}; \overline{S}_t = \frac{\sum_{i=1}^{5} S_{it}}{4}; \overline{W}_t = \frac{\sum_{i=1}^{3} W_{it}}{3} \]

Where \( \overline{D}_t \) = value of financial development index which is the average value of all the constituent indicators in \( t \)-period. \( \overline{V}_t \) = value of financial vulnerability index which is the average value all indicators constituent in \( t \)-period. \( \overline{S}_t \)
= value of financial soundness index which is an average value of all indicators constituent in t-period. \( \bar{W} \) = value of world economy climate index which is an average value of all indicators constituent WECI in t period.

3. Finally, the aggregate financial stability index is composed as follows:

\[
AFSI = \frac{4D_t}{18} + \frac{7V_t}{18} + \frac{4S_t}{18} + \frac{3W_t}{18}
\]

Financial system stability index has a value between 0 and 1. If the index value close to 0 means that the country has an unstable financial system, while if the value close to 1 means that the country has a stable financial system.

**Analysis the Impact of Financial Inclusion on Financial Stability**

In analyzing the impact of financial inclusion on financial stability in Asia, the equation used from Pontines Morgan (2014) with tobit model. The equation is composed as follows:

\[
AFSI_{it} = b_1 + b_2IFI_{it} + b_3LGDPP_{it} + b_4CGDP_{it} + b_5LIQ_{it} + b_6NFDI_{it} + b_7OPNS_{it} + b_8D_{it} + e_{it}
\]

Where:

AFSI\(_{it}\) : Index of Financial Stability for country i year t
IFI\(_{it}\) : Financial Inclusion Index for country i year t
LGDPP\(_{it}\) : LN GDP per capita for country i year t (Index)
CGDP\(_{it}\) : The ratio of private credit from bank deposits and other financial institutions of GDP for country i year t (%).
LIQ\(_{it}\) : Liquid assets to deposits and short-term financing for country i year t (%).
NFDI\(_{it}\) : Non-FDI capital flows to GDP for country i year t (Index).
OPNSₙ : financial openness index (financial openness) for country i year to t.
Dₙ : dummy of financial crisis variables for country i in year t (1 if during the crisis and 0 when there’s no crisis).

3. RESULT AND DISCUSSION

3.1. Financial Inclusion Based on Income Group Countries

Table 2 shows the average financial inclusion index (IFI) based on the Income Group Countries consisting of lower middle income countries, upper middle, and high income countries. The financial inclusion index consists of three dimensions that represent access to banking sector (d₁), financial services availability (d₂), and usability (d₃).

<table>
<thead>
<tr>
<th>Group</th>
<th>Average</th>
<th>d₁</th>
<th>d₂</th>
<th>d₃</th>
<th>IFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMIC</td>
<td>0.110138</td>
<td>0.044099</td>
<td>0.200312</td>
<td>0.126935</td>
<td></td>
</tr>
<tr>
<td>UMIC</td>
<td>0.23624</td>
<td>0.186435</td>
<td>0.253909</td>
<td>0.23611</td>
<td></td>
</tr>
<tr>
<td>HIC</td>
<td>0.584477</td>
<td>0.404452</td>
<td>0.478446</td>
<td>0.484437</td>
<td></td>
</tr>
</tbody>
</table>

where LMIC =Lower Middle Income Countries; UMIC=Upper Middle Income Countries.; HIC : High Income Countries.; d₁=dimension of access to banking sector with normalized data.; d₂ =dimension of financial services availability with normalized data. d₃= dimension of financial services usability with normalized data. And IFI= Index of Financial Inclusion.

Table 2 shows that high income countries group has the highest average index of financial inclusion. The financial inclusion index is valued at 0.484 where the value is more than 0.3, which means high income countries group is the group of countries with moderate financial inclusion (Sarma 2008). High income countries group has the highest average index of financial inclusion since high income countries group has high value of
banking penetration dimension represented by the number of deposit accounts at commercial bank per 1000 adult population, availability of financial services dimensions represented by a number of commercial bank branches per 100 000 population adults, and product usability of formal financial institutions dimensions represented by the proportion of outstanding loans and deposit to GDP.

Upper-middle income countries has an average value of financial inclusion index at 0.236. The index value is less than 0.3 so classified in the group of countries with poor financial inclusion (Sarma 2008). Dimension that contribute the greatest value on the financial inclusion index in upper middle income countries group is dimension of financial services usability. It is represented by the relatively high proportion of outstanding loans and deposit to GDP compared to other dimensions. The obstacles in the implementation of financial inclusive in Upper-middle income countries group is lack of financial services illustrated by low number of branches provided by commercial banks.

Lower middle income countries group has the lowest average value of financial inclusion index at 0.127. The index value is less than 0.3 so classified in the group of countries with poor financial inclusion (Sarma 2008). All dimension of financial inclusion in the group of middle income countries is the lowest compared to other groups. Moreover, the lowest dimension in lower middle income group of countries is availability of financial services illustrated by the low number of branches provided by commercial banks.

Financial Stability Based on Income Group Countries

Table 3 shows the results of calculation for the average financial stability index based on Income Group Countries. Financial system stability index is composed of four sub-indexes representing the development of financial sector, the vulnerability of financial sector, the soundness of financial sector, and world economic climate. From the calculation results obtained as follows:
Table 3 Financial System Stability Index Based on Income Group Countries

<table>
<thead>
<tr>
<th>Group</th>
<th>Average</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FDI</td>
<td>FVI</td>
<td>FSI</td>
<td>WECI</td>
<td>AFSI</td>
</tr>
<tr>
<td>LMIC</td>
<td>0.291402</td>
<td>0.383061</td>
<td>0.582903</td>
<td>0.636415</td>
<td>0.449327</td>
</tr>
<tr>
<td>UMIC</td>
<td>0.38888</td>
<td>0.48467</td>
<td>0.568669</td>
<td>0.622765</td>
<td>0.505066</td>
</tr>
<tr>
<td>HIC</td>
<td>0.583699</td>
<td>0.534287</td>
<td>0.518552</td>
<td>0.654864</td>
<td>0.561867</td>
</tr>
</tbody>
</table>

Where FDI is Financial Development Index; FVI: Financial Vulnerability Index; FSI is Financial Soundness Index; WECI: World Economic Climate Index; and AFSI is Aggregate Financial Stability Index (Indeks Stabilitas Sistem Keuangan).

Table 3 shows that the group of countries having the highest value of an average financial stability index is high income countries group. The high index of financial stability in high-income group of countries due to the relatively high constituent sub-indexes such as the Financial Development Index and Financial Vulnerability Index. The high index of financial development is illustrated by the high average value of capital in the financial markets, high value of domestic credit, low interest rate spreads, and high concentration of banking sector. Then, the high index of financial vulnerability is illustrated by the low rate of inflation and high real effective exchange rate.

Either lower middle income countries group or upper middle income countries group has lower value of financial stability index than high-income countries group because group of lower middle income countries and upper middle income have low value of financial development index. The low index of financial development is illustrated by low value of the capital in the financial markets and the low domestic credit value thus inhibiting stability of financial system.

Impact of Financial Inclusion of the Financial System Stability Based on income group countries
This is the result of regression using tobit model to answer the impact of financial inclusion and other factors on financial stability based on income group countries:

**Table 4 Impact of financial inclusion and other factors on financial stability based on income group countries.**

<table>
<thead>
<tr>
<th></th>
<th>LMIC AFSI</th>
<th>UMIC AFSI</th>
<th>HIC AFSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFI</td>
<td>0.07829</td>
<td>0.01375</td>
<td>0.1529***</td>
</tr>
<tr>
<td>LNGDP</td>
<td>0.01384</td>
<td>0.0239</td>
<td></td>
</tr>
<tr>
<td>CGDP</td>
<td></td>
<td>0.00097***</td>
<td></td>
</tr>
<tr>
<td>LIQ</td>
<td>-0.0017*</td>
<td>-0.00003</td>
<td>0.00286***</td>
</tr>
<tr>
<td>NFDI</td>
<td>-0.3231</td>
<td>0.0472</td>
<td>0.02981</td>
</tr>
<tr>
<td>OPNS</td>
<td></td>
<td>0.02667</td>
<td>-0.02489***</td>
</tr>
<tr>
<td>D</td>
<td>-0.06472***</td>
<td>-0.0703***</td>
<td>-0.05436***</td>
</tr>
<tr>
<td>Cons</td>
<td>0.3888***</td>
<td>0.24639</td>
<td>0.6293***</td>
</tr>
<tr>
<td>Wald-Chi²</td>
<td>32.25</td>
<td>53.39</td>
<td>78.35</td>
</tr>
<tr>
<td>P-value</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

*** : Significant level of 1%, ** : Significant level of 5%, * : Significant level of 10%.

Table 4 shows that financial inclusion has a positive impact on the stability of the financial system in lower and upper middle income countries group, but the effect is not significant. In high income countries group, financial inclusion has a positive and significant impact with a significance level at 1%, which means increasing in financial inclusion in terms of access, availability and usability of financial services will improve the stability of financial system. This is due to increasing in financial inclusion illustrates the strengthening of real sector. In addition, increasing in financial inclusion will be followed by a strengthening of the base deposit that can be used to improve the process of intermediation (Khan 2011).

Other variables also affect the stability of financial system. Other variables that significantly affect financial stability are the ratio of private credit from bank deposits and other financial institutions to GDP. This variable is a significant positive influence on stability of financial system over the group of middle income countries with a significance level at 1%, it means
increasing in the ratio of private credit from bank deposits and other financial institutions to GDP will improve the stability of financial system. This is because increasing in private credit will lead to growth in the real sector and growth in financial sector that will strengthen the stability of financial system (Sahay et al. 2015).

Liquid assets to deposits and short-term financing in lower middle income countries has significantly negative affect on financial stability with a significance level at 5%. The negative impact due to increasing in the availability of liquid assets liabilities will reduce the proportion of credit so it will resist function of formal financial institutions (Calderon and Serven 2011). In the group of high-income countries, liquid assets to deposits and short-term financing has a positive and significant impact on financial stability with a significance level at 1%, which means increasing in liquid assets to deposits and short-term financing will improve stability of financial system. The positive impact due to increasing in liquid assets will enhance customer’s trust to the bank when shock happened (Morgan and Pontines 2014).

Financial openness has a significant negative impact on stability of financial system in high-income countries at the level of 1%. It means increasing in financial openness will reduce the stability of financial system due to high level of financial openness will increase the vulnerability to capital outflows from short-term capital when shocks occur. Capital outflow will be followed by volatile capital (depreciation of capital in the stock market) and the depreciation of the currency will eventually enhance instability in financial system (Estrada, Park, and Ramayandi 2015).

Last variables that affect the stability of financial system is crisis dummy variable. The financial crisis significantly affects the stability of financial system with a significance level at 1% in all income level group. The impact of crisis causes instability in the financial system. This is because the financial crisis lead to reducing customer’s trust. it will lead to bank runs that may cause
ineffectiveness of the financial system, which means creating a financial system instability (Han and Melecky 2013).

4. FINDING AND CONCLUSION

Group of countries with higher income level has a better level of average access, availability and usability of financial services so that it has higher value of financial inclusion index than lower income group. Group of countries with higher income level also has higher value of financial stability index than lower income group. The high average index of financial stability in group of countries with higher income due to many factors such as having high value of capital in the financial markets, having high concentrations of banking sector, and having low level of inflation, and so on.

Financial inclusion has a positive impact but not significant to the stability of financial system in the group of lower and upper middle income countries, but has a significant positive impact on the stability of financial system in high-income countries group. This is because increasing in financial inclusion illustrates the strengthening of the real sector. In addition, the increase in financial inclusion will be followed by a strengthening of the base deposit that can be used to improve the process of banking intermediation (Khan 2011).

This paper provide three recommendation: first, for the financial services authority and banking sector, especially in lower middle income group and upper middle income group should encourage the availability of financial services such as an increasing in the number of bank branches in order to encourage financial inclusion. Second, for the government and the financial sector in lower middle income and upper middle income countries should encourage sub-index of financial development by encouraging capital flow in financial markets and enhancing domestic credit. For the financial services authority and banking sector in high income countries, to encourage financial inclusion can also push the financial soundness index by increasing bank capital to assets and reducing volatility of banking return on assets.
It may be strategies to enhance stability of financial system. Third, for further research, it’s better to add low-income countries group if it hasn’t problem of data availability.

References


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An Early Warning
Towards The Resilience of Islamic Banking In Indonesia

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Abstract
An early warning system (EWS) is widely used as surveillance mechanism for preserving financial system stability. It is conducted by identifying some potential variables that can issue alarm preceeding crisis. Islamic banking which is part of financial system, is also prone to crisis due to adverse external shocks and given interconnectedness nature in the financial system. This paper addresses one primary question, namely which macroeconomic variables that are capable of signaling adverse shocks towards the resilience of Islamic banking in Indonesia. We
use an extraction signal approach as EWS mechanism. The reasons are (a) this approach is the simplest approach for EWS, (b) the approach can be updated regularly, usually in monthly basis, (c) this approach has the lowest cost, and (d) the approach can develop a composite index that can be used as a signaling device. This paper employs various time horizons and thresholds in order to measure the predictive power of leading variables. The results suggest that there are several variables that (1) IBRI, which is composed from standardized deposit and financing since 2004 until 2016 in monthly basis, is able to figure out the resilience of Islamic banking. The resilience of Islamic banking was worst in 2004, but gradually decreased and stable. Interestingly, the resilience of Islamic banking was considered stable since the index was moving below the normal line during the global financial crises, and (2) Some selected macrofinancial variables, M2/reserve (M2res), credit growth (CG), real effective exchange rate (REER), and inflation rate (INF) empirically show low noise to signal ratio. It means that these four variables are capable of signaling vulnerabilities from adverse external shocks. This paper is considered a very preliminary work in the area of early warning system for the resilience of Islamic banking. However, there is no clear cut leading indicators to comprehensively monitor its resilience. More macroeconomic and financial variables are needed to be included as leading indicators for capturing the resilience of Islamic banking. In addition, given that macroeconomic and financial variables play the important thing in providing the resilience, the macroprudential policy needs to be more specifically addressing procyclicality in the financial sector. Meanwhile, the resilience of Islamic banking needs to be supported by the resilience in the real sector. It is because the core operations of Islamic banking are dealing with productive sector. Therefore, the synergic policies are needed to establish strong resilience of Islamic banking, namely stable macroeconomic environment and strong real sector development.

*Keywords*: early warning system, resilience of Islamic banking, extraction signal approach

*JEL Classification*: E44, F15, G01
1. INTRODUCTION

Islamic banking operation in Indonesia was started in 1992 when the first full-fledged Islamic bank was established, Bank Muamalat Indonesia. This Islamic bank provedly survived from the 1998 Asian financial crisis without any government assistance. The growth of Islamic banking proliferated rapidly after the new banking act was officially stipulated in 1998. Afterwards, the Islamic banks operations become widely expanded and well-accepted by all level of society in Indonesia. The growth of Islamic banking industry can be traced back from growth on its asset, deposit, and financing side. In terms of asset, it grew drastically from only Rp 21 trillion or 0.17% share out of total assets in the banking industry in 2005 to Rp 242 trillion or 4.89% out of total asset in banking industry in 2013. In terms of deposit, it increased from only Rp 16 trillion in 2005 to Rp 184 trillion in 2013. Likewise, in terms of financing side, there was a significant increase from only Rp 15 trilllions in 2005 to Rp 184 trillion in 2013. Overall, asset, deposit, and financing grew steadily on average at 30% over the year 2005 to 2013.

There are two main risk assessments conducted by Bank Indonesia (BI) on Islamic banking, financing risk and liquidity risk. In terms of financing risk, in semester I 2015, the growth of gross Non-performing Financing (NPF) had dropped significantly from 65.15% in semester II 2014 to 20.79%. This condition is driven by a successful domestic banking consolidation, namely the adjustment of financing-to-Value (FTV) which enable banking industry aggresively to extend the financing towards value-added economic sectors for generating economic growth. However, the nominal NPF increased slightly in semester I around 4.72%, from 4.33% in semester II 2014. In general, according to financing risk assessment, the resilience of Islamic banking is on alert condition NPF ratio almost reaches the stipulated tolerance limit of BI around maximum at 5% (BI Regulation No 15, year 2013).

In terms of liquidity risk, Islamic banks faced a decrease liquidity ratio in semester I 2015. It was shown by dropping the ratio of liquid tools, namely liquid asset (LA) over negotiable certificate of deposit or banking deposit guarantee (NCD), and
liquid asset (LA) over deposited funds (DPK), from 98.16% and 16.31%, in semester II 2014 to 71.30% and 12.60%, respectively in semester I 2015. A higher of ratios indicate that Islamic banking is having a sufficient liquid assets over the liabilities, or in other words Islamic banks are capable of avoiding and minimizing liquidity mismatch arising from banking operations. In this case, Islamic banking may expose to liquidity risk due to a decreased in the amount of liquid assets.

The resilience of Islamic banking can be defined as the ability of Islamic banking to resist adverse shocks originated from macroeconomic factors, so this ability can preserve the soundness of its balance sheet. The adverse shocks are exogeneous shocks which then damage the resilience of Islamic banking due to incomplete markets in financial system. Incomplete markets denote a condition where markets become incapable to hedge all possible risks exposed into them. This incomplete market may create financial fragility, contagion, and bubbles in financial system due to the shocks are not smoothly absorbed. Likewise, Islamic banking can fall into default as its inability to withstand amplified shocks, shown by deterioration in its balance sheet. Given that the financial system is interconnected, the failure in Islamic banking can create panic behavior in the markets and ultimately encourage bank-run. The balance sheet then becomes worst as shocks become endogeneously deteriorating. A situation which makes Islamic banking fail and may trigger a larger crisis, expressed in a general worsening of Islamic banking’s balance sheets, is due to a deterioration of the macroeconomic environment. On this regards, major crises in financial system cannot simply be avoided from macroeconomy stability due to there is a dynamic interaction between financial system - which Islamic banking is part of it – and macro conditions. Therefore, unanticipated response from financial system in absorbing shocks from macroeconomic environment can make Islamic banking fail and may cause chain reactions in a tightening surrounding, including worsening of bank’s balance sheet.

The current study aims to identify which macroeconomic variables are capable of signaling adverse shocks towards the
resilience of Islamic banking in Indonesia. This study uses the simple approaches in EWS mechanism as surveillance tools for the resilience of Islamic Banking in Indonesia.

2. LITERATURE REVIEW
The development of the leading indicators of banking distress and early-warning systems has long been a main interest of central banks and academics. Studies on this were written by Caprio and Klingebiel (1996), Lindgren et al. (1996), Sachs et al. (1996), Honohan (1997), Eichengreen and Rose (1998), Demirgüç-Kunt and Detragiache (1998, 2000), Hardy and Pazarbasioglu (1999), Glick and Hutchison (2001), González-Hermosillo (1999), Kaminsky and Reinhart (1999), Duttagupta R. and P. Cashin (2011), Davis and Karim (2008). In practice, there are approaches commonly used to deal with early warning system (EWS), including non-parametric and parametric approaches.

Among those, Eichengreen and Rose (1998) use multivariate Probit regression for understanding the role of international shocks in determining banking crises in developing and emerging economies. They find that interest rate shocks stemming from OECD countries as well as their GDP growth rate have a significant and strong effect on bank fragility in developing countries. Hutchison (2002) estimates multivariate Probit models linking the probability of banking risks to domestic macroeconomic variables and institutional characteristics. He finds that the following variables are strongly and significantly associated to banking crisis: inflation, GDP growth, exchange rate turbulence 1 as well as variables describing the characteristics of the financial and the regulatory environments. Demirgüç-Kunt and Detragiache (1998) find that low GDP growth, high real interest rates, and high inflation are significantly correlated with the occurrence of a banking crisis. Demirgüç-Kunt and Detragiache (2000) compare the results with the signal approach of Kaminsky and Reinhart (1999), and show that their model performs better in terms of in-sample prediction.
Yucel (2011) did some observations regarding a non-exhaustive collection of the early warning literature from 1971 to 2011. In terms of the methodologies, binary dependent variable (the logit analysis) has been the most popular used, meanwhile signal extraction analysis shares the second place.

In the literature, large number of empirical investigations has been carried out using multivariate logit or probit models for developing banking distress leading indicators. Wong et.al (2007), for example, developed a probit econometric model to identify a set of leading indicators of banking distress and estimate banking distress probability for Hong Kong and other EMEAP (Executives' Meeting of East Asia and Pacific Central Banks) namely Australia, China, Indonesia, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore, and Thailand economies. Macroeconomic fundamentals, currency crisis vulnerability, credit risk of banks and companies, asset price bubbles, credit growth, and the occurrence of distress of other economies in the region are found to be important leading indicators of banking distress in the home economy. A case study of Hong Kong based on the latest estimate of banking distress probability and stress testing results shows that currently the banking sector in Hong Kong is healthy and should be able to withstand well certain possible adverse shocks. The study also finds that banking distress is contagious, suggesting that to be effective in monitoring banking distress, close cooperation between central banks should be in place.

Further, Wong et.al (2010) developed a panel probit econometric model to identify the leading indicators of banking distress and to estimate the banking distress probability for EMEAP economies. Macroeconomic fundamentals, currency crisis vulnerability, credit risks of banks and non-financial companies, asset price gaps, credit growth, and the occurrence of distress in other economies are found to be important leading indicators.
Matthieu Bussiere and Marcel Fratzscher (2006) developed an early warning system (EWS) model, based on a multinomial logit model, for predicting financial crises. It is shown that commonly used EWS approaches, which use binomial discrete-dependent-variable models, are subject to what we call a post-crisis bias. We show that applying a multinomial logit model, which allows distinguishing between more than two states, is a valid way of solving this problem and constitutes a substantial improvement in the ability to forecast financial crises. The empirical results reveal that, for a set of 20 open emerging markets for the period 1993-2001, the model would have correctly predicted a large majority of crises in emerging markets.

Another commonly adopted approach is the signal extraction approach. Extraction signal approach produced variable importance rankings that can be used in the stepwise specifications of logistic regression. This nonparametric approach makes fewer assumptions about the underlying populations, less sensitive to outlying observations, and easier for practitioners to understand. This approach was elaborated by Kaminsky and Reinhart (1996) by evaluating the usefulness of several leading indicators in signaling an impeding crisis. Related to this approach, Gurnain et.al (2013) focused on a quantitative method to identify vulnerabilities, specifically an imbalance indicator model and its application to Canada. The model proves useful for isolating historical imbalances that could be indicators of financial system vulnerabilities. It complements other sources of information, including market intelligence and regular monitoring of economic and financial data.

Manasse et.al (2013) employed a recent statistical algorithm (CRAGGING) in order to build an early warning model for banking crises in emerging markets. They perturb the data set many times and create “artificial” samples from which we estimated our model, so that, by construction, it is flexible enough to be applied to new data for out-of-sample prediction. The study finds that, out of a large number (540) of candidate explanatory variables, from macroeconomic to balance sheet indicators of the
countries’ financial sector, they can accurately predict banking crises by just a handful of variables. Using data over the period from 1980 to 2010, the model identifies two basic types of banking crises in emerging markets: a “Latin American type”, resulting from the combination of a (past) credit boom, a flight from domestic assets, and high levels of interest rates on deposits; and an “Asian type”, which is characterized by an investment boom financed by banks’ foreign debt. The model is compared to other models obtained using more traditional techniques, a Stepwise Logit, a Classification Tree, and an “Average” model, and they find that their model strongly dominates the others in terms of out-of-sample predictive power.

3. RESEARCH METHODOLOGY
3.1. Research Approach

This paper empirically identifies some selected macroeconomic variables that can affect the resilience of Islamic banking. An extraction signal approach was initially elaborated by Kaminsky and Reinhart (1996). An early warning system (EWS) mechanism evaluates the usefulness of several variables in signaling a crisis. This approach is considered as non parametric approach since it involves monitoring the evolution of a number of economic variables. The EWS monitors behavior of variables which usually departs from “normal/tranquil” in the period preceeding a crisis. Deviations of these variables from their “normal” level beyond a certain threshold values are considered as warning”signal” of a crisis within a specified period.

Kibritcioglu (2003) argued that there are three advantages of non-parametric approaches:

(1) The developed index is an important component to extract a crisis and then useful as surveillance tool.
(2) Non-parametric approach is easily employed within a single-country framework.
(3) It can be used to differentiate between “normal” and “crisis” condition by setting a certain threshold.
Similarly, Adiningsih, et. al (2002), following the approach developed by Herrera and Garcia (1999), where they used the extraction signal approach for some reasons:

(1) This approach is the simplest approach for EWS
(2) The approach can be updated regularly, usually in monthly basis
(3) It has the lowest feasible cost
(4) It can be used to aggregate the individual leading indicators into a composite index, and this index is used as a signaling device.

3.2. Stages for Building EWS through Signal Approach

1. Defining The Resilience of Islamic Banking

Financially, a bank is exposed to the risk as the value of its asset and liability dynamically change in the financial market. Subsequently, the risk can lead to trigger instability in the financial system. Some of selected risks which are potentially exposed due to external shocks on Islamic banking are: (1) liquidity risk due to the presence of massive bank run; (2) credit risk due to rising non-performing loans. A bank’s worth and failure in Islamic banking can be associated with the excessive risk taking behavior. Some studies incorporated massive bank run and withdrawals (Diamond and Dybvig, 1983), lending booms (Hanohan, 1997), and are considered among the most important causes that affecting the resilience of banking system, including Islamic banking.

In respect to repeated financial crisis in the modern financial system, this paper develops Islamic Banking Resilience Index (IBRI) to support monitoring tasks by incorporating some components. The components are intended to display the relative importance of the various risks in the composition of the IBRI.

There are two important risks covered in the IBRI, namely liquidity and credit risk. Credit risk relates with the banking operation in the midst high non-performing loans. Banks are financial intermediaries whose liabilities are mainly short-term deposits and whose assets are considered short and long term. When the value of banks’ assets fall short of the value of their liabilities, banks can be trapped into insolvent situation. This fall is
mainly due to incapability of borrowers to fulfilling their current and future obligations and can affect the fall in banks’ assets. Hence, credit risk can occur due to borrowers do not fulfill their obligations. In addition, given that banks are difficult due to borrowers’ default, liquidity problems start to emerge. Capital position would be affected as banks need immediate injection to preserve its operation and mitigate systemic risk arises. This situation may attract some depositors to personally save their deposits by withdrawing from the bank account. The problems are compounded if the deposits are in massive numbers. Therefore, credit risk is perceived as triggering factor in causing liquidity risk.

According to those risks, a monthly IBRI is developed and used to investigate whether Islamic banking is considered under a resilient or crisis condition. IBRI is composed of two main Islamic banking variables, (1) deposits (DEP), and (2) financings (FIN). DEP is calculated by taking a sum of demand, saving, and time deposit collected by Islamic banks. In addition, FIN is obtained from a sum of various type of financings extended by Islamic banks. Technically, IBRI is calculated as follows:

\[
IBRI_t = \frac{IDEP_t - \mu_{DEP}}{\sigma_{DEP}} + \frac{IFIN_t - \mu_{FIN}}{\sigma_{FIN}}
\]

Where:

\[
IDEP_t = (DEP_t - DEP_{t-12})/DEP_{t-12}
\]
\[
IFIN_t = (FIN_t - FIN_{t-12})/FIN_{t-12}
\]

Equation (1) shows the calculation of IBRI which is obtained by a sum of standardized values of DEP and FIN. The standardization enables the variance is standardized and avoids the possibility of any one or two components dominating the IBRI. The \(\mu\) and \(\sigma\) denote the arithmetic average and standard deviation of two components of IBRI. In addition, equation (2) and (3) are single index of respective component by taking 12-month change – avoiding seasonality data.

2. Defining The Signal of Crisis
Let assume $i$ = a univariate variable, $j$ = a particular country, $S$ = signal variable, and $X$ = variable. A variable relates to variable $i$ and country $j$ is expressed by $x_i^j$ and the threshold for this variable is denoted as $x^j$. Then, a signal variable relates to indicator $i$ and country $j$ is denoted by $S_i^j$. The binary model is then developed, where $S_i^j = (0,1)$, and if the variable crosses the threshold, a signal is emitted, $S_i^j = 1$. Mathematically, it can be described:

$$\{S_i^j = 1\} = \{x_i^j > x^j\}$$

(4)

Meanwhile, if the indicator remains within its threshold boundary, it behave normally and does not issue a signal, $S_i^j = 0$.

$$\{S_i^j = 0\} = \{x_i^j \leq x^j\}$$

(5)

Meanwhile, in terms of defining crisis, the research borrows the IBRI that has been developed in previous section, as follows:

$$\{C_i^j = 0\} = \{|IBRI_i^j| \leq \text{Threshold}\}$$

(6)

$$\{C_i^j = 1\} = \{|IBRI_i^j| > \text{Threshold}\}$$

(7)

Interpreting Crisis and Signal Framework

Once the crisis and signal are defined, the evaluation criteria can be conducted by using matrix framework. Kaminsky, et. al (1998) developed matrix crisis-signal framework by using 24 months as signal window horizon, as follows:

| Table 1. The Performance of Individual Indicator by Matrix Crisis-Signal Framework |
|---------------------------------|-----------------|
| Crisis (C=1)                    | No Crisis (C=0) |
| Signal Issued (S=1)             | $A$             | $B$             |
| No Signal Issued (S=0)          | $C$             | $D$             |


In this matrix, $A$ is the number of months in which the indicator issued a good signal, $B$ is the number of months in which the indicator issued a bad signal or “noise”, $C$ is the number of months in which the indicator failed to issue a signal (which would have been a good signal), and $D$ is the number of months in which the indicator refrained from issuing a signal (which would have been a bad signal).

According to Kaminsky, et. al (1998), a perfect indicator would only produce observations that belong to the north-west
and south-east cells of this matrix. It would issue a signal in every month that is to be followed by a crisis (within the next n months, example 24 months), so that $A > 0$ and $C = 0$, and it would refrain from issuing a signal in every month that is not to be followed by a crisis (within the next n months, example 24 months), so that $B = 0$ and $D > 0$. For sure, none of the indicators fit the profile of a perfect indicator, but the matrix will be a useful reference to assess how close or how far is each indicator from that profile.

2. Determining Evaluation Criteria

This paper employs six evaluation criteria in order to assess the performance of leading variables which was identified through crisis-signal framework, as follows:

1. The proportion of observations correctly called = $\frac{A+D}{(B+D)+(A+C)}$, defined as the proportion that all observations correctly bring information about crisis and not crisis. This implies that the higher proportion occurred will lead to best evaluation criteria.

2. The noise-to-Signal-Ratio = $\frac{B/(B+D)}{A/(A+C)}$, it measures the false signals as a ratio of the good signals issued. The selection rule is to pick the variable or model that minimizes the noise to signal ratio (NTS).

3. The proportion of crises correctly called = $\frac{A}{A+C}$, defined as the proportion of crisis happened once the signal was issued. Thus, the higher of its proportion would be fitting of a perfect indicator in signaling the crisis.

4. The proportion of false alarm of total alarms issued = $\frac{B}{A+B}$, given that an individual indicator exposes a frequent false signal. Thus, the lower of its proportion would be good to minimize the panic behavior in the markets.
(5) The proportion of crisis given an alarm issued = \( \frac{A}{A+B} \), given that an individual indicator generates different signals. This criterion is to select indicators that can maximize the probability of a crisis, given a signal was issued as alarm.

(6) The proportion of probability of crisis given no alarm issued = \( \frac{C}{C+D} \), given the signal is important, an occurrence of crisis without signals was extremely reduced or minimized.

3. Determining Signaling Horizon

This paper involves various signaling horizons. This signaling horizons are range of period that has ability for anticipating a crisis. Kaminsky (1997) uses 24 month signaling horizon. He argued that the longer signaling horizon would enable policy makers to anticipate a crisis. Meanwhile, Bussiere and Fratzscher (2002) set 12 and 18 month as signal horizon. They argues that various time horizons would provide the best achievable trade-off between missing crises and wrong signal. In addition, this paper adds another 3 and 6 month as signaling horizons considering that a crisis is difficult to be predicted. Providing short horizon enables policy makers to react immediately as crisis starts to build up.

4. Determining Thresholds

The economy evolves through phases of booms and recession. This change in phase of a particular series is captured empirically by finding a “threshold”. It turns a fluctuation of a given variable into a signal of an upcoming recession or crisis. The threshold is the one that minimizes the noise-to-signal ratio of a particular indicator.

5. Determining Leading Indicators

Vulnerabilities in a financial system can build overtime and the system’s operation depends on macroeconomic developments that ultimately can affect individual institutions. Developing a set of
indicators is important to help detecting in advance macroeconomic and financial vulnerabilities that can affect the banking system. There is no clear-cut macroeconomic model to analyze the macro-fundamental that are relevant as leading indicators for the resilience of Islamic banking. This paper adopts some variables suggested by Susatyo (2002) in detecting currency crises. He used data since 1990-2000 in monthly basis by using 14 variables in order to identify leading indicators. He found that out of 14 variables, only M2/Reserve, inflation rate, credit growth, and real effective exchange rate that are relevant as leading indicator for currency crises in Indonesia. Similarly, Garcia and Herrera (1999) studied on early warning for currency crisis and suggested M2/reserve, credit growth, real effective exchange rate, and inflation rate. Although these leading leading indicators are used for currency crises, Jacobs and Kuper (2004) argued that banking crises may be associated with currency crises through a number of channels of causation or the other way round. Therefore, these leading indicators will be used in the case for banking crises in Indonesia, as follows:

1. M2/Reserve (M2Res) is used to capture the vulnerability as the sudden capital outflows. The higher ratio M2/total reserve denotes the increase of likelihood of banking crisis or reducing the resilience of Islamic banking

2. Credit growth (CG) is defined as the percentage change of the total credit approved in several banks, namely national banks, regional development banks, national private banks, and foreign banks. This variable indicates the fast expansion of loans which later give additional default risk in the banking system. In addition, Credit growth which is considered excessive may lead to systemic risk, given interconnectedness in the financial system. Rapid credit growth episode can increase likelihood of systemic risk and deterioration of banks’ balance sheets.

3. Real effective exchange rate (REER) is defined as the variable which is obtained by deflating Nominal exchange rate with the ratio between standardized (based on a certain base year period). Consumer price index (CPI)
United States of America over CPI of Indonesia. REER is important to measure comparative change in a country’s real economic circumstances compared other country. If the REER of a country shows a downward trend (overvaluation), it implies that the price of domestic country is higher that foreign price, vice versa. Hence, the overvaluation in the real exchange rate may create an increased possibility of crises.

4. Inflation rate (INF) is defined as the difference of CPI between current CPI and previous CPI after being standardized. The higher degree of inflation implies that likelihood of crises would occur.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Transformation</th>
<th>Frequency</th>
<th>Threshold Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>M2/Res</td>
<td>Level</td>
<td>Monthly Data</td>
<td>Over Zero Line</td>
</tr>
<tr>
<td>CG</td>
<td>12 month change</td>
<td>Monthly Data</td>
<td>Over Zero Line</td>
</tr>
<tr>
<td>REER</td>
<td>Level</td>
<td>Monthly Data</td>
<td>Over Zero Line</td>
</tr>
<tr>
<td>INF</td>
<td>12 month change</td>
<td>Monthly Data</td>
<td>Over Zero Line</td>
</tr>
</tbody>
</table>

4. RESEARCH FINDINGS

The Performance of Islamic Banking Resilience Index and Leading Variables

Figure 1 shows the Islamic Banking Resilience Index (IBRI) since March 2004 till May 2016. Generally, IBRI measures and monitors the level of resilience of Islamic banking in Indonesia. Empirically, IBRI is capable of providing information on the ups and downs in the resilience of Islamic banking with respect of various economic vulnerabilities. Figure 1 also presents facts that in 2004, the resilience of Islamic banking was worst, indicated the IBRI is above green line, which was in crisis area. But, the trend is gradually decreasing and until may 2016, the resilience is below normal area (purple line). In addition, according to orange line,
which reflects the 1-year moving average of IBRI, the trend is increasing and showing excessive risk taking starts to happen in Islamic banking. Hence, the policy makers should keep prudent in regulating Islamic banking operations in Indonesia.

Figure 1. Islamic Banking Resilience Index (IBRI)

Figure 2 shows the performance of M2/res in Indonesia over 1990 – 2016 in monthly basis. According to the figure, the red line, which is the 1 year moving average, is exceeded several times by the blue line (M2/res variable). It indicates that M2/res is pressured and possibly got shocks as economic deteriorated. Period of 1998, 2005, 2008, are the years where economic and financial distress hit severely into Indonesia’s economy, as shown in the figure 1.

Figure 2. The Performance of M2/Reserve in Indonesia, Period 1990 – 2016 (Monthly Basis)
Figure 3. The Performance of Credit Growth in Indonesia, Period 1990–2016 (Monthly Basis)

Figure 3 shows the performance of credit growth in Indonesia over the period of 1990-2016 in monthly basis. Figure 3 obviously presents some abnormal behavior of credit growth, indicated by exceeding the red line. There are six period where credit growth is considered showing abnormal behavior, namely in 1990, 1998, 2000, 2006, 2008, and 2014. In all these abnormal period, credit growth seems to be declining once it grows rapidly or excessively. Hence, credit growth can be seen to represent the period of boom and burst in the financial cycle.

Figure 4 shows the performance of REER in Indonesia since 1990-2016 in monthly basis. Interestingly, over the period of observation, REER presents an abnormal behavior only during Asian financial crisis in 1998. It reflects during this crisis, Indonesia’s economy is hit severely by crisis so lossing its competitiveness even though theoretically REER is undervalued compared to foreign prices.
Figure 4. The Performance of Real Effective Exchange Rate in Indonesia, Period 1990 – 2016 (Monthly Basis)

Figure 5 shows the performance of inflation rate in Indonesia since 1990 to 2016. During Asian financial crisis, inflation rate was extremely high, but gradually decreases and shows a low level by 2016. Likewise, during global financial crises in 2007-2008, inflation rate was quite high and exceeded the red line. Hence, an increase in inflation rate could be a clear indication of a country’s deterioration.

Figure 5. The Performance of Inflation rate in Indonesia, Period 1990 – 2016 in Monthly Basis
The Signal Generating Mechanism on Several Leading Variables

This section explains the performance of every leading variable by using signal extraction signal approach. This paper applies several threshold multiplier, namely according to Kaminsky (1996) – 3 standard deviation, Garcia (1999) - 1.5 standard deviation, Park (2001) – 1.1 standard deviation, and Lestano, et.al (2003) – 1.0 standard deviation. In addition, to evaluate the predictive power of every leading variable in detecting crisis, this paper uses different time horizon, namely 3 month, 6 month, 12 month, 18 month, and 24 month.

Table below summarizes the performance of several leading indicators included in the paper. It informs that four variables are relevant as leading indicators for the resilience of Islamic banking in Indonesia. It is reflected by the low noise to signal ratio, almost zero, and low the proportion of false alarm of total alarms. These results are obtained by using kaminsky approach which employ 3, 6, 12, 18, 24 month time horizon. Looking at time horizon, the 3 month is seen as best horizon to predict the likelihood of a crises into Islamic banking. It seems relevant in the midst of fast changing of current domestic and global economy. The short time horizon indicates the need for policy makers to prepare early anticipation as macrofinancial variables start to behave abnormal. Meanwhile, Lestano’s approach is consistently able to capture best result on the proportion of crisis given an alarm. It implies that this approach is suitable to detect a signal followed by a crisis in the following 24 month.
Table 3. The Summarize of Performance on Leading Indicators

<table>
<thead>
<tr>
<th>Var.</th>
<th>Noise to Signal Ratio (-)</th>
<th>The proportion of observations correctly called (+)</th>
<th>The proportion of crises correctly called (+)</th>
<th>The proportion of false alarm of total alarms issued (-)</th>
<th>The proportion of crisis given an alarm issued (+)</th>
<th>The proportion of probability of crisis given no alarm issued (-)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M2/Res</td>
<td>Kaminsky – 0 (3,6,12,18,24)</td>
<td>Garcia – 0,33 (3)</td>
<td>Park – 0,61 (3)</td>
<td>Kaminsky – 0 (3,6,12,18,24)</td>
<td>Lestano – 0,65 (24)</td>
<td>Lestano – 0,86 (3)</td>
</tr>
<tr>
<td>CG</td>
<td>Kaminsky – 0,02 (3)</td>
<td>Kaminsky – 0,09 (6)</td>
<td>Garcia – 0,63 (3)</td>
<td>Kaminsky – 0,5 (3,6,12,18,24)</td>
<td>Lestano – 0,63 (24)</td>
<td>Park and Lestano – 0,95 (3,6)</td>
</tr>
<tr>
<td>REER</td>
<td>Kaminsky – 0 (3,6,12,18,24)</td>
<td>Lestano – 0,23 (18)</td>
<td>Garcia – 0,59 (3)</td>
<td>Kaminsky – 0 (3,6,12,18,24)</td>
<td>Lestano – 0,61 (24)</td>
<td>Lestano – 0,61 (3,24)</td>
</tr>
<tr>
<td>INF</td>
<td>Kaminsky – 0 (18)</td>
<td>Garcia – 0,19 (3)</td>
<td>Kaminsky – 1 (18)</td>
<td>Kaminsky – 0 (18)</td>
<td>Lestano – 0,62 (24)</td>
<td>Lestano – 0,62 (24)</td>
</tr>
</tbody>
</table>

(+), (-) denotes the value of each evaluation criteria, (+) means bigger better, and (-) means smaller better.

(3,6,12,18,24) indicates time windows horizon

4. CONCLUSION

This paper is basically attempting to build an early warning system for the resilience of Islamic banking in Indonesia. The Islamic Banking Resilience Index (IBRI) is developed to help monitoring and anticipating the potential vulnerabilities in Islamic banking. In addition, some selected macrofinancial variables are employed, such as M2/reserve, credit growth, real effective exchange rate, and inflation rate. Technically, this paper uses several level of thresholds which are able to capture the level of resilience of Islamic banking in Indonesia. Moreover, some time horizon, such as 3, 6, 12, 18, and 24 months are incorporated to obtain predictive power of above selected macrofinancial variables in signaling a crisis.

This research suggests several findings, as follows:

1. IBRI, which is composed from standardized deposit and financing since 2004 until 2016 in monthly basis, is able to figure out the resilience of Islamic banking. The resilience of Islamic banking was worst in 2004, but gradually decreased
and stable. Interestingly, the resilience of Islamic banking was considered stable since the index was moving below the normal line during the global financial crises.

2. Some selected macrofinancial variables, M2/reserve (M2res), credit growth (CG), real effective exchange rate (REER), and inflation rate (INF) empirically show low noise to signal ratio. It means that these four variables are capable of signaling vulnerabilities from adverse external shocks.

This paper is considered a very preliminary work in the area of early warning system for the resilience of Islamic banking. However, there is no clear cut leading indicators to comprehensively monitor its resilience. More macroeconomic and financial variables are needed to be included as leading indicators for capturing the resilience of Islamic banking. In addition, given that macroeconomic and financial variables play the important thing in providing the resilience, the macroprudential policy needs to be more specifically addressing procyclicality in the financial sector. Meanwhile, the resilience of Islamic banking needs to be supported by the resilience in the real sector. It is because the core operations of Islamic banking are dealing with productive sector. Therefore, the synergic policies are needed to establish strong resilience of Islamic banking, namely stable macroeconomic environment and strong real sector development.

REFERENCES


What Protects Emerging Markets from Developed Countries Unconventional Monetary Policy Spillover?

Eko Sumando

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The revised version will be prepared for forthcoming on Bulletin of Monetary and Banking

Abstract

This paper investigates the macro-characteristics that reduce the developed countries unconventional monetary policy (UMP) spillover effect on the emerging market countries. An event study method is used to examine 24 UMP announcements and a panel fixed effects model to examine the characteristics of the emerging markets, the spillover channel considered in this study is countries’ exchange rate. The results show an unclear significance of macroeconomic fundamentals to the emerging markets’ currency resilience. Deeper financial markets contribute to better resilience. Trade linkages with China provide less vulnerable currency position of the emerging markets while trade linkages with developed countries provide mixed evidence. The macro-prudential policy and the capital flow measures that the emerging
markets countries implemented before to the announcements are moderately effective in reducing the spillover.

*Keywords*: unconventional monetary policy, emerging markets, international spillover

**JEL Classification**: E52, E58

1. **INTRODUCTION**

The global financial crisis in 2008 had a significant impact to the design and implementation of developed countries monetary policy. In response to the crisis, the Federal Reserve Bank (FED), the European Central Bank (ECB), the Bank of England (BOE), and the Bank of Japan (BOJ) adjusted their short term interest rates to zero and applied Quantitative Easing (QE) as an alternative monetary policy strategy (Fawley & Neely 2013). The QE action included large scale purchases of government bonds and private securities, and several lending programmes (Bean 2012). Recently there has been wide interest in the impact of developed countries unconventional monetary policy not only on the country themselves but also on their international spillovers.

The International Monetary Fund (IMF) (2013) suggests that developed countries unconventional monetary policy generate greater global financial spillovers when the policy objectives were meant to restore financial market stability. Global trade, liquidity and portfolio rebalancing may transmit the impact of unconventional monetary policy measures adopted in the developed countries to other countries (Chen et al., 2012). Despite this new challenge in the monetary system, few studies in literature focus on the effect of developed countries unconventional monetary policy on emerging market. Having a better understanding of the international implications of developed countries unconventional monetary policy is important for emerging market policy makers to cope better with the challenges implied by such policies.
Few studies have discussed this issue and the evidence about the effect of developed countries unconventional monetary policy on emerging market is mixed (Chen et al. 2012; Fic 2013; Fratzscher et al. 2013; Mishra et al. 2014; Moore et al. 2013). A question remains whether the emerging market macroeconomic fundamentals, financial system characteristics and macro-prudential policy are significant in reducing the spillover impacts of unconventional monetary policy. However, the focus has been on the effects of the FED’s QE. This study contributes to the existing literature in two ways: First, it fills a gap by analyzing all developed countries unconventional monetary policy, including not only the FED, but also the policy from the ECB, the BOE and BOJ between 2008 and 2012. Secondly, this study sheds new understanding on the importance of macroeconomic fundamentals, financial depth, trade linkages and macro-prudential policy in reducing the spillover of developed countries unconventional monetary policy, particularly through exchange rate as the spillover channel.

This paper examines 24 developed countries unconventional monetary policy announcement events and 15 emerging markets reactions using a two-step method. First, an event study method is used to analyze the significance of the announcement to the exchange rate change with a two-day window event. Then, the panel data fixed effects model is used to reveal the individual characteristics of the countries prior to the event that may enforce the spillover.

The results show unclear significance of the macroeconomic fundamentals. From three main indicators, only inflation was found to significantly contribute positively to exchange rate depreciation. Deeper financial markets contribute to better country resilience to exchange rate depreciation. Countries with high stock market capitalization and larger liquid assets (M3) are more stable than countries that are not. Trade linkage with China provides less vulnerable currency position to the emerging markets. On the other hand, trade linkages with developed countries provide mixed evidence. Higher imports from the US and the UK contribute to higher currency volatility. Furthermore,
macro-prudential policy and capital flow management measures implemented by the emerging markets prior to the unconventional monetary policy announcement were found to be moderately effective in reducing the country exchange rate depreciation from the spillover.

The rest of the paper is organized as follows: Section 2 provides a literature review on unconventional monetary policy and its international spillovers, particularly to the emerging market. Section 3 describes the data used in this study. Section 4 describes the method. Section 5 describes the result and provides discussion. Section 6 concludes.

2. LITERATURE REVIEW

2.1 Developed Countries Unconventional Monetary Policy

Generally, central banks implement monetary policy through managing the short term policy rate. However, facing near-zero short term interest rates, developed countries central banks have turned to unconventional monetary policies involving large scale asset purchases. The FED, the BOE, the ECB and the BOJ began to apply QE and asset purchases on a very large scale since 2008 until 2013 (Figure 1). The consequence of these policies was a large increase in central bank balance sheets. Figure 1 shows the evolution of short term interest rates in the US, the UK, the Euro Area and Japan, and the size of individual banks’ balance sheets (normalized to 100 at the beginning of August 2007) which reflects the scale of unconventional monetary policy actions (Fic 2013).
The IMF (2013) suggest that this large scale asset purchases contributed to some portfolio rebalancing across the world and generated strong capital flows between developed countries and emerging markets. Furthermore, Fratzscher et al. (2013) argues that when financial markets are thin, capital inflows can cause rapid currency appreciation, which can affect the country’s export sectors and returns from net foreign assets. However, the rapid credit expansion induced by the unconventional monetary policy can encourage exchange rate instability in the emerging markets if the capital inflows are followed by rapid flow reversals.

The IMF (2013) noted that at first the QE program was meant to prevent a financial system meltdown and strengthen financial intermediation but later the objective shifted to stimulating the economy. The QE policies are different across central banks and depend on their specific objective and different economy structures of the individual countries. For example, the FED’s and the BOE’s QE program is focused on bond purchases while the BOJ and the ECB focused on direct lending to banks. Fawley and Neely (2013) suggested that the different tools reflected different structures of these developed countries economies, in the US and the UK bond markets play a relatively more important role than banks, while it is the opposite for Europe and Japan.
2.2 Unconventional Monetary Policy and International Spillovers

The developed countries unconventional monetary policy measures had a definite impact to the emerging market countries. Emerging markets countries leaders, particularly Brazil, describes the quantitative easing is comparable to a monetary tsunami that can trigger sudden capital reversal away from emerging market countries (Fic 2013; Fratzscher et al. 2013). Some studies provide evidence about the international spillovers of developed countries unconventional monetary policy to the emerging markets. However, the studies available mainly focused on the FED policy spillovers.

Chen et al. (2012) studied the cross-border spillovers of developed countries QE to 16 emerging market countries. Using an event study method, they examine the cross-border financial market impact of the FED QE announcements of asset purchase during 2008 to 2012. They find that the FED QE announcement influenced a broad range of emerging market assets prices, raising equity prices, and lowering government and corporate bond yields. This evidence supports the view that developed countries QE program influenced international market expectations about the strength of international capital flows to the emerging market. In other words, the QE measures increased the global liquidity through the immediate re-pricing of assets in international financial markets. Furthermore, they used a global vector error-correcting model (VECM) to measure the estimated size of the spillover and found that the size effects differed across regions. In some economies such as Hong Kong and Brazil, the expansionary impact of US quantitative easing was significant and associated with rapid credit growth and strong capital inflow, currency appreciation and inflationary pressures.

In addition, Moore et al. (2013) studied the FED large-scale asset purchases (LSAPs) announcement impact on capital flows from the US to 10 emerging market countries from 2008 to 2010. Using panel ordinary least square, they find that a 10-basis-point reduction in long-term U.S. Treasury yields contributes to
almost 0.4-percentage-point increase in the foreign ownership share of emerging market debt which in turn estimated will reduce the emerging market government bond yields by almost 1.7 basis points. Their study suggests the significance of the US capital outflows to the emerging markets and its impact on the long-term emerging market government bond yields. Furthermore, the author assess the robustness of these estimates by employing event study and vector autoregression method and find similar results in aggregates. They also find different marginal effects across emerging market countries but do not explore the country specific characteristics.

To complement the evidence about the international spillover of developed countries unconventional monetary policy, Fic (2013) investigates the effect of all unconventional monetary policy implemented four major developed countries central bank on four major developing countries: Brazil, Russia, India and China from 2008 to 2012. This means the analysis not only focused on the FED policy, but also the ECB, the BOE and the BOJ. Using the event study method, she finds that developed countries unconventional monetary policy affected exchange rates, equity prices, and long term yields. The unconventional monetary policy has had a significant spillover through channels such as global trade, global liquidity and global portfolio rebalancing. Her event study analysis shows that the quantitative easing policy contributed to long term yields decreasing by almost 175 basis points in Brazil, and 25 basis points in Russia, India and China. The quantitative easing policy has also contributed to increases in equity prices in the Brazil, China and India.

The impact of developed countries unconventional monetary policy on the developing economies may vary. Chen et al. (2013), Fic (2013) and Moore et al. (2013) argues that it depends on the scale of their exposure to the developed countries in terms of trade and financial linkages or other spillover channel, and the type and scale of response of the monetary authorities in that country to capital flows. However, three studies above do not mention the characteristics of macroeconomic fundamentals, financial system and capital flow regulation of each country.
2.3 Unconventional Monetary Policy Spillover and Emerging Markets Characteristics

Fratzscher, et al. (2013) address this emerging markets characteristics issue by analyzing the global impact of the FED unconventional monetary policy from 2007 to 2010 on 65 foreign financial markets, including emerging markets, through net capital inflows and price of bonds and equity as the spillover channel. They found that the FED unconventional monetary policy has influenced the reallocation of portfolio in worldwide financial markets. The first phase of quantitative easing triggered a rapid capital outflow from the emerging markets to the US but the next phase triggered it to the opposite direction. Furthermore, they found no evidence that exchange rate or capital account policies may aided the emerging market countries in protecting themselves from the US monetary policy spillovers. This study illustrates how US unconventional monetary policy has contributed to portfolio reallocation as well as a re-pricing of risk in global financial markets.

In addition, Eichengreen and Gupta (2014) use cross sectional regression of emerging market foreign reserves, equity prices, and exchange rates and relate the reaction of these variables to macroeconomic fundamentals and country’s financial markets characteristics. They examine the spillover effect of the FED tapering announcement from April to August 2013 and found that the tapering talk brings immediate sharp negative impact on emerging markets. Furthermore, they show that the impacts vary across countries. Countries with higher financial depth experienced higher exchange rate depreciations. However, countries with better macroeconomics fundamentals characteristics such as lower budget deficit, lower public debt, high level of reserves, or high rate of economic growth did not experienced a significant different impact compared to those who are not. It shows that the size of the country’s financial market is a more important determinant than their macroeconomic fundamentals. This may interpreted as the global investors’
capacity to rebalance their portfolios when the target country has a relatively large and liquid financial market (IMF 2013a).

In the opposite of both studies, Mishra, et al. (2014) argue that macroeconomic fundamentals and macro-prudential policy are important in minimizing the spillover effect of US monetary policy. They conducted an event study analysis of the FED QE announcement using government bond yields, stock prices and exchange rates daily data, between January 2013 and January 2014, for 21 emerging markets. The results suggest that markets differentiated across countries during the episodes unconventional monetary policy announcement based on countries characteristics, including macroeconomic fundamentals and economic and financial structures. Countries with deeper financial markets, better macroeconomic fundamentals, and better macro-prudential policy experienced less exchange rate depreciations and less increase in government bond yields. They also found that having strong trade exposure with China can help reduce markets negative reaction.

The different period of announcements, length of data sets of countries and methodology in each paper may explain the ambiguous findings. The mixed evidence of previous studies also shows two gaps which this research will address. These are the need to cover all developed countries unconventional monetary policy spillover effects on emerging markets, and also to examine whether macro fundamentals, financial structure and macro-prudential policy is significant in minimizing spillover.

3. METHODOLOGY

Data
This study examined 24 unconventional monetary policy announcement events by the FED, the BOE, the ECB and the BOJ as described in Table 8 (Appendix). The key spillover channel are daily exchange rates (local currency/US$) from January 2008 to December 2012.

The study used data from 15 Emerging Markets including Brazil, Colombia, Chile, Indonesia, India, Korea, Mexico,
Malaysia, Philippines, Peru, Russia, South Africa, Singapore, Turkey and Thailand. The selected country macro-characteristics are decomposed into several categories: (a) macroeconomics fundamentals: growth rate, inflation, and the ratio of current account balance to GDP; (b) financial depth: the ratio of stock market capitalization to GDP, the ratio of M2 to GDP and the ratio of M3 to GDP ratio; (c) trade linkage with Developed Countries: the United States, the United Kingdom, Europe area and Japan; (d) trade linkage with China, and (e) macro-prudential policy and or capital flow measures implemented by the countries fiscal and monetary authorities. Table 9 (Appendix) listed the variables description and data source are. All the variables occurred a quarter before the event.

The data for the macro-prudential policy and the capital flow management measure conducted by emerging market countries during 2008 to 2012 are taken from Zhang and Zoli (2014), and the IMF (2012) policy paper about the interaction of monetary and macro-prudential policies and the Annual Report on Exchange Arrangements and Exchange Restrictions (IMF 2013c).

Method
The method in this study replicate Mishra et al. (2014) which proceeds in two steps. First, an event study analysis is used to examine the significance of each event to the change of the exchange rate in two-day window (a day before and a day after the event). Secondly, panel fixed effect model is used to examine the relation of the change in the exchange rate with the countries macroeconomic characteristics a quarter before the event.

3.1 Examining The Announcement Event
An event study analysis was used to examine the developed countries unconventional monetary policy announcements, because this method is able to capture the impact of an event in a short time window, since the spillover effects of developed countries unconventional monetary policy is expected to rapidly transmit around the date of the event. This method is also used in previous studies (Chen et al. 2012; Fic 2013; Mishra et al. 2014).
The “events” or the dates of the FED, the ECB, the BOE and the BOJ announcements (Appendix) and market reactions around these events will be pooled around each year period. These events will be analyzed using model (1).

\[ \Delta y_{c,i} = \alpha + \beta^i D_i \]  

(1)

where \( \Delta y \) is the exchange rate change (two-day window) of country \( c \) at the event \( i \); \( D_i \) is a dummy for the announcement event \( i \). This model will provide a matrix of the change in exchange rate of emerging market countries when an unconventional monetary policy announcement happened.

A pooled time-series analysis will be used to measure the significance and the size of the coefficient \( \beta \). Positive \( \beta \) coefficient indicates exchange rate depreciation while negative \( \beta \) coefficient indicates exchange rate appreciation. In this study, the event that contribute to exchange rate depreciation will be classified as a negative event \( (D_i^N) \).

**Measuring The Change in The Exchange Rate**

In order to standardized the change of the exchange rate (local currencies/US$) of emerging markets countries \( (\Delta y_{c,i}) \), this study used two measurement of change which are the logarithm change after and before the event described in (i) and the mean deviation of the log change in the year when the event \( i \) occurs described in (ii).

\[ \Delta y_{c,i} = \ln y_{c,i+1} - \ln y_{c,i-1} \times 100 \]

where \( \Delta y_{c,i} \) is the change in exchange rate of country \( c \), at the announcement event \( i \) which come from the log of exchange rate at the day after the event \( (\ln y_{c,i+1}) \) minus the log of exchange rate at the day before the event \( (\ln y_{c,i+1}) \).

\[ \Delta y_{c,i} = \frac{lnY_{c,i} - \mu_{lnY_{c,i,year}}}{\sigma_{lnY_{c,i,year}}} \]

where \( \Delta y_{c,i} \) is the change in exchange rate of country \( c \), at the announcement event \( i \) which come from the log of exchange rate of country \( c \), at the time of the event \( i \) \( (lnY_{c,i}) \) minus the mean of
log of exchange rate of country \( c \) in the year when the event \( i \) occurs \((\mu_{lnY_{c,i,year}})\) divided by the standard deviation of log of exchange rate of country \( c \) in the same year \((\sigma_{lnY_{c,i,year}})\).

### 3.2 Significance of Macroeconomic Country Characteristics

Secondly, panel regressions will be estimated by pooling the events across the emerging markets. The panel fixed effects regressions in model (2) will examine the relationship of the exchange rate changes of the negative events with each country characteristics and the event and characteristics interactions. The panel fixed effects model also used in previous studies (Eichengreen & Gupta 2014; Moore et al. 2013)

The model specification is as follows:

\[
\Delta y_{ci} = \alpha + \beta D_{i}^{N} + \gamma x_{c,i-q} + \delta D_{i}^{N} * x_{c,i-q} + s_{c} \tag{2}
\]

where \( D_{i}^{N} \) is a dummy for negative event \( i \) (when the country experienced exchange rate depreciation), \( x_{c,i-q} \) is the country \( c \) macroeconomics and financial system characteristic a quarter before the event, \( s_{c} \) is the country-fixed effect. \( s_{c} \) controls country characteristics that are not varying over time. Country fixed effects also control for other country variables which are not likely to change over the one year period. \( x_{c,i-q} \) can be time varying and non-time varying. For regressions where \( x_{c,i-q} \) is time-invariant, the variable will be collinear with the country fixed effect and will drop out. \( \delta \) is the coefficient of interaction variable that capture the effect of the event and country characteristics at the same time.

### 4. RESULTS AND DISCUSSIONS

#### 4.1 Unconventional Monetary Policy Announcements Effect

An event study method used to examine the immediate markets reactions around the unconventional monetary policy event announcement listed in Table 8 (Appendix). The method employs
Equation (1) which relates the two-day logarithm change (i) and the mean deviation to the exchange rate logarithm change (ii) to a constant and a dummy of the events.

The regression result in Table 1 shows that emerging markets reacted negatively or experienced exchange rate depreciation to announcements (2), (15), and (16) referred to in Table 8. The opposite reaction happened in the (13) and (17) announcement. Interestingly, the result shows that the FED, the ECB, the BOE and the BOJ have an effect on the emerging market significantly in some announcements.

The first significant and strongest markets’ reaction is on October 15 2008, when the ECB announced and expanded long term refinancing operations. This event is happen at the same time with the beginning of the GFC episode in 2008. The significant currency depreciation among emerging market on this day is consistent with Fic (2014) and Chen et al. (2012), where they noted that the ECB measures to stabilize the macroeconomic condition in Europe and the GFC contributed significantly to net capital outflows from emerging markets. These findings may indicate that ECB unconventional monetary policy measures may have intensified the magnitude of the capital outflow at the time of crisis.

The next significant reaction is on September 21 2011, when the FED announced the purchasing of US$ 400 billion US Treasury securities. This action by the FED that focused on purchases of US Treasury securities has a primary aim on stimulating the US economy by lowering yields, and pushing up asset prices in riskier market segments (Fratzscher et al. 2013). This action builds pressure to the emerging markets currency. Furthermore, Figure 3 (Appendix) shows that 13 out of 15 countries experienced exchange rate depreciation at this date. Only Turkey and Indonesia do not experience the currency depreciation impact.

The last significant depreciation event is on August 30 2010, when the BOJ added 10 trillion JPY in 6 month loans to the fixed rate operations. The BOJ central bank balance sheet policies
have a small but significant financial spillover. This policy might have had negative spillover on some trade competitors via the exchange rate channel (IMF 2013b).

Beside the depreciation episode, two announcements significantly contribute to exchange rate appreciation. First is when the ECB conducted an intervention in the Euro Area private and public debt securities markets in May 2010. This finding bring into line what the IMF policy paper (IMF 2013a) mention about the importance of the ECB announcements in sending the market stability signal in the Euro area. The announcement of the debt intervention in some core euro area countries and in much of the rest has significantly lowered bond yields in the euro area. This reduction in the yield in the euro area led to a generalized rally in of capital flows into the emerging markets (IMF 2013a).

The next event is interesting because it involves two central bank policies. In October 2011, the BOE announced the purchase of nearly £275 billion in assets. At the same time, the ECB announced the purchasing of €40 billion in Euro-denominated covered bonds. This policy resulted in significant capital inflows to emerging markets and exchange rate appreciation described in Figure 4. Hosono and Isobe (2014) study confirm that these two policies contribute to the lower bond yield in this two big economies. This may generate capital inflows from developed countries to emerging markets.

Overall, these findings are consistent with the results from Chen et al. (2012) and Fic (2013) that suggest developed countries unconventional monetary policies contributes to some capital flow episodes between developed countries and the emerging markets.
Table 1. Significance of The Unconventional Monetary Policy Announcements

<table>
<thead>
<tr>
<th>Event</th>
<th>Log Change</th>
<th>Mean Deviation</th>
<th>Event</th>
<th>Log Change</th>
<th>Mean Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-0.089</td>
<td>-0.005</td>
<td>13</td>
<td>-0.804**</td>
<td>-0.073**</td>
</tr>
<tr>
<td></td>
<td>(0.290)</td>
<td>(0.029)</td>
<td></td>
<td>(0.357)</td>
<td>(0.040)</td>
</tr>
<tr>
<td>2</td>
<td>2.457***</td>
<td>0.236***</td>
<td>14</td>
<td>-1.115</td>
<td>-0.107</td>
</tr>
<tr>
<td></td>
<td>(1.013)</td>
<td>(0.099)</td>
<td></td>
<td>(0.811)</td>
<td>(0.084)</td>
</tr>
<tr>
<td>3</td>
<td>0.535</td>
<td>0.068</td>
<td>15</td>
<td>0.400**</td>
<td>0.038**</td>
</tr>
<tr>
<td></td>
<td>(0.436)</td>
<td>(0.045)</td>
<td></td>
<td>(0.186)</td>
<td>(0.015)</td>
</tr>
<tr>
<td>4</td>
<td>-0.318</td>
<td>-0.044</td>
<td>16</td>
<td>0.981**</td>
<td>0.096**</td>
</tr>
<tr>
<td></td>
<td>(0.366)</td>
<td>(0.036)</td>
<td></td>
<td>(0.476)</td>
<td>(0.045)</td>
</tr>
<tr>
<td>5</td>
<td>0.262</td>
<td>0.018</td>
<td>17</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(0.340)</td>
<td>(0.029)</td>
<td></td>
<td>(0.037)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>6</td>
<td>-0.181</td>
<td>-0.008</td>
<td>18</td>
<td>-0.165</td>
<td>-0.022</td>
</tr>
<tr>
<td></td>
<td>(0.386)</td>
<td>(0.040)</td>
<td></td>
<td>(0.232)</td>
<td>(0.026)</td>
</tr>
<tr>
<td>7</td>
<td>-0.290</td>
<td>-0.039</td>
<td>19</td>
<td>0.237</td>
<td>0.021</td>
</tr>
<tr>
<td></td>
<td>(0.232)</td>
<td>(0.024)</td>
<td></td>
<td>(0.211)</td>
<td>(0.024)</td>
</tr>
<tr>
<td>8</td>
<td>0.018</td>
<td>0.001</td>
<td>20</td>
<td>-0.297</td>
<td>-0.031</td>
</tr>
<tr>
<td></td>
<td>(0.254)</td>
<td>(0.024)</td>
<td></td>
<td>(0.139)</td>
<td>(0.016)</td>
</tr>
<tr>
<td>9</td>
<td>0.159</td>
<td>0.011</td>
<td>21</td>
<td>0.160</td>
<td>0.012</td>
</tr>
<tr>
<td></td>
<td>(0.286)</td>
<td>(0.031)</td>
<td></td>
<td>(0.234)</td>
<td>(0.025)</td>
</tr>
<tr>
<td>10</td>
<td>-0.290</td>
<td>0.026</td>
<td>22</td>
<td>-0.251</td>
<td>-0.023</td>
</tr>
<tr>
<td></td>
<td>(0.268)</td>
<td>(0.027)</td>
<td></td>
<td>(0.185)</td>
<td>(0.017)</td>
</tr>
<tr>
<td>11</td>
<td>-0.062</td>
<td>-0.006</td>
<td>23</td>
<td>-0.347</td>
<td>-0.028</td>
</tr>
<tr>
<td></td>
<td>(0.176)</td>
<td>(0.020)</td>
<td></td>
<td>(0.326)</td>
<td>(0.031)</td>
</tr>
<tr>
<td>12</td>
<td>-0.107</td>
<td>-0.009</td>
<td>24</td>
<td>0.023</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>(0.249)</td>
<td>(0.024)</td>
<td></td>
<td>(0.084)</td>
<td>(0.009)</td>
</tr>
</tbody>
</table>

***, **, and * denote statistical significance at 1, 5, and 10 percent levels respectively.
This event study method results used a pool time-series regression to analyze relation in the change in the emerging markets exchange rate and the dummy for the unconventional monetary policy announcements.
4.2. Market Reaction and Country Characteristics

Macro Fundamentals

The results in Table 2 show that the exchange rates for emerging markets are differentiated only on the basis of inflation. Countries with higher inflation have higher depreciation of their exchange rate. This is rather unexpected because unlike the current account balance and economic growth which is a macroeconomic indicator for countries’ trade and output, inflation only indicates price changes. The coefficient is significant and suggests that a country with a 1 per cent higher inflation rate will have higher currency depreciation by 0.11 percentage points compared to other countries. The interaction term shows that inflation will reinforce exchange rate depreciation only if it occurs at the same time with the announcements.
Table 2. Exchange Rate Log Change & Macro Fundamentals

<table>
<thead>
<tr>
<th></th>
<th>Exchange rate log change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dummy</td>
<td>1.010***</td>
</tr>
<tr>
<td></td>
<td>(0.203)</td>
</tr>
<tr>
<td>Growth</td>
<td>0.286</td>
</tr>
<tr>
<td></td>
<td>(0.356)</td>
</tr>
<tr>
<td>Inflation</td>
<td>1.022***</td>
</tr>
<tr>
<td></td>
<td>(0.204)</td>
</tr>
<tr>
<td>CA/GDP</td>
<td>0.118***</td>
</tr>
<tr>
<td></td>
<td>(0.040)</td>
</tr>
<tr>
<td>Interaction with</td>
<td></td>
</tr>
<tr>
<td>Growth</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
</tr>
<tr>
<td>Inflation</td>
<td>-0.015</td>
</tr>
<tr>
<td></td>
<td>(0.045)</td>
</tr>
<tr>
<td>CA/GDP</td>
<td>0.133**</td>
</tr>
<tr>
<td></td>
<td>(0.059)</td>
</tr>
<tr>
<td></td>
<td>-0.001</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
</tr>
</tbody>
</table>

Observation 360 360 360
R-squared 0.07 0.12 0.07

***, **, and * denote statistical significance at 1, 5, and 10 percent levels respectively

These findings contradict the Mishra et al. (2014) study that suggests the current account and growth rate before the announcements affects emerging market resilience. However, it is consistent with evidence from Chen et al. (2012) that shows that countries with better fundamentals such as a current account surplus does not perform differently to countries that have a deficit.

This may happen due to the different episodes in the unconventional monetary policy announcements in each studies. Mishra et al. (2014) studied 2013-2014 FED announcements, Chen et al. (2012) studied 2008-2012 FED announcements and this paper studied the FED, the BOE, the ECB and the BOJ announcements from 2008 to 2012. In other words, there might be less heterogeneity on the basis of macro-fundamentals around the announcements in this study and Chen et al. (2012) study.
Financial Depth

Table 3 shows countries with deeper financial markets are less vulnerable compared to those that are not. The result holds for standard measures of financial depth such as the stock market capitalization to GDP ratio and the M3 to GDP ratio except the M2 to GDP ratio.

Table 3. Exchange Rate Log Change & Financial Depth

<table>
<thead>
<tr>
<th></th>
<th>Exchange rate log change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dummy</td>
<td>1.225***</td>
</tr>
<tr>
<td></td>
<td>(0.373)</td>
</tr>
<tr>
<td>Stock Market</td>
<td>-0.019***</td>
</tr>
<tr>
<td>Capitalization/GDP</td>
<td>-0.012</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
</tr>
<tr>
<td>M2/GDP</td>
<td>-0.008*</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
</tr>
<tr>
<td>Interaction with</td>
<td></td>
</tr>
<tr>
<td>Stock Market</td>
<td>0.000</td>
</tr>
<tr>
<td>Capitalization/GDP</td>
<td>(0.003)</td>
</tr>
<tr>
<td>M2/GDP</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
</tr>
<tr>
<td>M3/GDP</td>
<td>0.002**</td>
</tr>
<tr>
<td></td>
<td>(0.0008)</td>
</tr>
</tbody>
</table>

| Observation              | 360                      |
| R-squared                | 0.27                     |

***, **, and * denote statistical significance at 1, 5, and 10 percent levels respectively

This result indicates countries with more liquid capital market and had large liquid assets have better stance in mitigating the spillover than countries that are do not have large liquid assets. However, the magnitude of the impact is relatively weak. This result is consistent with Mishra et al. (2014) and Bowman et al. (2014) who find that financial depth tends to enhance countries’
resilience to shocks because their deep markets facilitated the fine-tuning needed in capital flows and portfolios rebalancing.

**Trade Linkage with Developed Countries**

The effects of developed countries unconventional monetary policy on emerging markets could also transmit directly through the external demand or trade channel. Quantitative easing may increase the demand for emerging markets goods and services through easier trade credit and increase developed countries spending (Chen et al. 2012). However, such impacts depend on the developed countries trade elasticity.
Table 4. Exchange Rate Log Change & Trade Linkage with Developed Countries

<table>
<thead>
<tr>
<th></th>
<th>Exchange rate log change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dummy 0.735*** (0.232)</td>
</tr>
<tr>
<td></td>
<td>MUS 1.61 (2.17)</td>
</tr>
<tr>
<td></td>
<td>MUK 6.71 (8.65)</td>
</tr>
<tr>
<td></td>
<td>MJPN 1.18 (2.18)</td>
</tr>
<tr>
<td></td>
<td>XE 0.00 (0.00)</td>
</tr>
<tr>
<td></td>
<td>XUS 0.00 (0.00)</td>
</tr>
<tr>
<td></td>
<td>XUK 0.00 (0.00)</td>
</tr>
<tr>
<td></td>
<td>XJPN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Interaction with</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ME 0.00 (0.00)</td>
</tr>
<tr>
<td></td>
<td>MUS 1.63** (8.17)</td>
</tr>
<tr>
<td></td>
<td>MUK 2.23*** (7.66)</td>
</tr>
<tr>
<td></td>
<td>MJPN 1.19* (0.64)</td>
</tr>
<tr>
<td></td>
<td>XE 0.00 (0.00)</td>
</tr>
<tr>
<td></td>
<td>XUS 0.00 (0.00)</td>
</tr>
<tr>
<td></td>
<td>XUK 0.00 (0.00)</td>
</tr>
<tr>
<td></td>
<td>XJPN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Observation 360</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R-square</td>
</tr>
<tr>
<td></td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
</tr>
</tbody>
</table>

***, **, and * denote statistical significance at 1, 5, and 10 percent levels respectively

Table 4 describes the impact of trade linkages with developed countries. It shows that countries with higher import from the US and UK experience a higher depreciation of currencies. This result indicates quantitative easing’s ability to initiate carry trades and capital flows into developed countries.
when it is able to push consumer demand and increase asset prices.

**Trade Linkage with China**

Results in Table 5 show that countries with higher trade exposure to China have a much lower currency depreciation at the announcement event. Exposure to China is measured by the sum of a country’s exports to and imports from China as a ratio of its GDP. This result supports Mishra (2014) that suggest that greater trade linkage to other big economies offers better opportunity for diversifying risks, which helps reduce emerging market countries reactions to the developed countries unconventional monetary policy.

<table>
<thead>
<tr>
<th>Table 5. Exchange Rate Log Change &amp; Trade With China</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exchange rate log change</strong></td>
</tr>
<tr>
<td><strong>Dummy</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Export to China</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Interaction with</strong></td>
</tr>
<tr>
<td><strong>Export to China</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Observation</strong></td>
</tr>
<tr>
<td><strong>R-squared</strong></td>
</tr>
</tbody>
</table>

***, **, and * denote statistical significance at 1, 5, and 10 percent levels respectively

The coefficient on the interaction between the negative event dummy and exposure to China is negative and statistically significant. Countries with stronger trade links to China were less hit during the volatility episodes. These results can be interpreted as linkages with China acting as a buffer, whereby investors tend to display more confidence in countries which have greater exposure to China.

**Macro Prudential Policy & Capital Flow Measures**

Table 6 describes 13 countries out of 15 that are recorded to have implemented Macro-prudential policy and or capital flow
The macro-prudential policies considered includes loan-to-value policy, debt-to-income policy, reserve requirements, limits on assets acquisition and limits on bank lending in foreign exchange. While, the capital flow measures includes limits on borrowing abroad, restrictions on purchase of foreign assets, taxes on capital inflows and minimum stay requirements for new capital inflows.

Table 6. Macro-Prudential Policy and Capital Flow Management Measure in Emerging Markets

<table>
<thead>
<tr>
<th>Policy Measures</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macro-prudential Policy:</td>
<td>Indonesia</td>
<td>Indonesia</td>
<td>Indonesia, Peru, Turkey</td>
<td>Indonesia, India, Peru, Turkey</td>
<td>Indonesia, Brazil, India, Peru, Turkey, Turkey, Chile, Mexico, Philippines, Malaysia</td>
</tr>
<tr>
<td>Capital Flow Measures:</td>
<td>Indonesia</td>
<td>Indonesia</td>
<td>Indonesia, India, Peru, Turkey</td>
<td>Indonesia, India, Peru, Turkey</td>
<td>Indonesia, Brazil, India, Peru, Turkey, Turkey, Chile, Mexico, Philippines, Malaysia, Korea</td>
</tr>
</tbody>
</table>


Table 7 shows that emerging market countries with tighter macro-prudential policies and capital flow measures prior to the event experienced less exchange rate depreciation. The coefficient in the estimation results shows that capital flow measures are far more effective to maintain exchange rate stability.

These results support Mishra et al. (2014) and contradict Fratzscher et al. (2013) about the importance of macro-prudential policy and capital control measures to mitigate sudden capital reversals. This may imply that such measures tend to change the composition of investment in emerging countries towards less volatile and risky items.
The interaction terms between the event dummy and the policy measures suggesting that the marginal benefits of capital flow management is higher than macro-prudential policy when it is implemented before the event. Overall, the findings suggest that a tighter stance on both macro-prudential policy and capital flow measures in the run-up to the developed countries unconventional monetary policy episodes in 2008-12 helped mitigate the negative market reactions.

Table 7. Macro-Prudential Policy & Capital Flow Measure

<table>
<thead>
<tr>
<th></th>
<th>Exchange rate log change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dummy</strong></td>
<td>1.011***</td>
</tr>
<tr>
<td></td>
<td>(0.483)</td>
</tr>
<tr>
<td><strong>MPP</strong></td>
<td>-0.310***</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
</tr>
<tr>
<td><strong>CFM</strong></td>
<td>-3.683**</td>
</tr>
<tr>
<td></td>
<td>(0.174)</td>
</tr>
<tr>
<td>Interaction with</td>
<td></td>
</tr>
<tr>
<td><strong>MPP</strong></td>
<td>-0.660**</td>
</tr>
<tr>
<td></td>
<td>(0.028)</td>
</tr>
<tr>
<td><strong>CFM</strong></td>
<td>-2.371**</td>
</tr>
<tr>
<td></td>
<td>(0.101)</td>
</tr>
<tr>
<td><strong>Observation</strong></td>
<td>312</td>
</tr>
<tr>
<td><strong>R-squared</strong></td>
<td>0.08</td>
</tr>
</tbody>
</table>

***, **, and * denote statistical significance at 1, 5, and 10 percent levels respectively.

At the same time, the results may imply that capital flow liberalization carries risks, which are magnified when countries do not have sufficient levels of financial and institutional development. The risks include heightened macroeconomic volatility and vulnerability to crises or external spillover. In the absence of adequate financial regulation and supervision, financial openness can create incentives for financial institutions to take excessive risks, leading to more volatile flows that are prone to sudden reversal (IMF 2013b).

5. CONCLUSION

This study examined the impact of unconventional monetary policy measures adopted in developed countries (the US, UK,
Euro Area and Japan) on 15 emerging market countries from 2008 to 2012. The method was decomposed into two steps. First, event study techniques were used to study the impact of 24 QE announcements on the exchange rate change of emerging market countries. Then, panel fixed effect model was used to analyze the characteristics of the country that suffer the spillover effect before the announcements.

The event study results shows five announcements events that contributes significantly to exchanges rate changes in 15 emerging markets. Three announcements contribute to exchange rate depreciation while two announcements contribute to exchange rate appreciation. The significant exchange rate changes indicate sudden capital flows between developed countries and the emerging market countries.

The panel fixed effect regressions reveals the country characteristics prior to the events. The importance of Macro fundamentals is not clear. The interaction term showed only inflation reinforced the spillover effects when it occurs at the same time with the announcements. A deeper financial market enhances country resilience to the exchange rate depreciation.

This result consistent with other studies and indicate that the more liquid the countries financial market the better the country in adjusting to global monetary change (Eichengreen & Gupta 2014; Mishra et al. 2014). The trade linkage with China is beneficiary for emerging markets, the higher the net export volume to china, the less vulnerable they are to currency depreciation. On the other hand, higher imports from the US and the UK contribute to higher exchange rate depreciation.

Macro-prudential policy and capital flow measure contributes significantly to the country resilience to the spillovers. This study is consistent with Mishra et al. (2014) and contradicts Fratzscher et al. (2013) about the importance of macro-prudential policy and capital flow management measures. This paper also highlights the IMF (2013) notes about the efficacy of macro-prudential policy and capital flow management regulation to mitigate global risk on the emerging markets.
One policy implication for emerging market country policymakers is the need to employ macro-prudential policy and capital flow management measure to face possible sudden capital reversal when developed countries central banks conduct large scale asset purchases. Furthermore, policymakers in emerging markets need to emphasize to developed countries policymakers the importance of conducting unconventional monetary policy in an orderly manner to avoid turbulence in the global markets (IMF 2013b).

One limitation of this study, especially in the event study method, was the investor was assumed to be forward looking and the time-window for this assumption was very short (only two days) suggesting immediate reaction of the investors. Future research could incorporate a longer time window, for example: a week or more to consider a longer time reaction of investors.

REFERENCES


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APPENDIX

Table 8. Developed Countries Unconventional Monetary Policy Announcements

<table>
<thead>
<tr>
<th>No.</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>28 March 2008</td>
<td>ECB announced and expanded long term refinancing operations (LTRO)</td>
</tr>
<tr>
<td>2</td>
<td>15 October 2008</td>
<td>ECB announced and expanded long term refinancing operations</td>
</tr>
<tr>
<td>3</td>
<td>28 November 2008</td>
<td>FED announced of $100 billion in Government Sponsored Enterprise debt and $500 billion in mortgage backed securities (MBS) purchase.</td>
</tr>
<tr>
<td>4</td>
<td>19 January 2009</td>
<td>BOE announced the purchasing of nearly £50 billion of high quality private sector assets</td>
</tr>
<tr>
<td>5</td>
<td>5 March 2009</td>
<td>BOE announced the purchasing of £75 billion in assets</td>
</tr>
<tr>
<td>No.</td>
<td>Date</td>
<td>Description</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>6</td>
<td>18 March 2009</td>
<td>FED announced the purchasing of $300 billion in long term Treasuries and $750 billion in MBS, and $100 billion in MBS.</td>
</tr>
<tr>
<td>7</td>
<td>7 May 2009</td>
<td>BOE announced the purchasing of nearly £125 billion in assets; ECB announced the purchasing of €60 billion in Euro-denominated covered bonds; 12 month LTRO announced</td>
</tr>
<tr>
<td>8</td>
<td>6 August 2009</td>
<td>BoE announced the purchasing of nearly £175 billion in assets</td>
</tr>
<tr>
<td>9</td>
<td>5 November 2009</td>
<td>BoE announced the purchasing of £200 billion in assets</td>
</tr>
<tr>
<td>10</td>
<td>1 December 2009</td>
<td>BOJ offered 10 trillion JPY in 3 month loans</td>
</tr>
<tr>
<td>11</td>
<td>11 March 2010</td>
<td>FED announced the purchasing of $600 billion in Treasuries</td>
</tr>
<tr>
<td>12</td>
<td>17 March 2010</td>
<td>BOJ expanded the size of the fixed rate operations to 20 trillion JPY</td>
</tr>
<tr>
<td>13</td>
<td>10 May 2010</td>
<td>ECB conducted interventions in the Euro Area private and public debt securities markets.</td>
</tr>
<tr>
<td>14</td>
<td>21 May 2010</td>
<td>BOJ offered 3 trillion JPY in 1-year loans to private institutions</td>
</tr>
<tr>
<td>15</td>
<td>30 August 2010</td>
<td>BOJ added 10 trillion JPY in 6 month loans to the fixed rate operations</td>
</tr>
<tr>
<td>16</td>
<td>21 September 2011</td>
<td>FED announced the purchasing of $400 billion in Treasuries</td>
</tr>
<tr>
<td>17</td>
<td>6 October 2011</td>
<td>BOE announced the purchasing of nearly £275 billion in assets; ECB announced the purchasing of €40 billion in Euro-denominated covered bonds</td>
</tr>
<tr>
<td>18</td>
<td>8 December 2011</td>
<td>ECB LTRO expanded, 36 month LTRO announced</td>
</tr>
<tr>
<td>No.</td>
<td>Date</td>
<td>Description</td>
</tr>
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<td>-----</td>
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<td>--------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>19</td>
<td>20 February 2012</td>
<td>FED announced the purchasing of long term securities and sell short term securities; at the pace of about $45 billion per month</td>
</tr>
<tr>
<td>20</td>
<td>13 September 2012</td>
<td>FED announced the purchasing of $40 billion of MBS per month</td>
</tr>
<tr>
<td>21</td>
<td>12 December 2012</td>
<td>FED announced the purchasing of $45 billion of long term Treasuries per month without sterilization</td>
</tr>
<tr>
<td>22</td>
<td>9 February 2012</td>
<td>BOE announced the purchasing of £325 billion in assets</td>
</tr>
<tr>
<td>23</td>
<td>5 July 2012</td>
<td>BOE announced the purchasing of £375 billion in assets</td>
</tr>
<tr>
<td>24</td>
<td>6 September 2012</td>
<td>ECB announced the potential purchasing of the debt of countries that applied to the European Stabilization Mechanism in unlimited amounts on the secondary market.</td>
</tr>
</tbody>
</table>

Source: Fawley & Neely (2013)

**Table 9. Variables Description and Data Source**

<table>
<thead>
<tr>
<th>No.</th>
<th>Factors</th>
<th>Variables</th>
<th>Description</th>
<th>Data Source</th>
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<td>Macro Fundamentals</td>
<td>GRO WTH</td>
<td>Economic Growth</td>
<td>CEIC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CPI CA</td>
<td>Inflation Current Account % of GDP</td>
<td>CEIC</td>
</tr>
<tr>
<td>2</td>
<td>Financial Depth</td>
<td>CAP M2</td>
<td>Stock Market Capitalization M2 % of GDP</td>
<td>CEIC/Trading Economics/OEC</td>
</tr>
<tr>
<td>No.</td>
<td>Factors</td>
<td>Variables</td>
<td>Description</td>
<td>Data Source</td>
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<td>-------------</td>
</tr>
<tr>
<td>1</td>
<td>M3</td>
<td>M3 % of GDP</td>
<td></td>
<td>D CEIC/Trading Economics/OEC</td>
</tr>
<tr>
<td>3</td>
<td>Trade Link with Developed Country</td>
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<td>Import from Europe</td>
<td>CEIC</td>
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<td>MUK</td>
<td>Import from England</td>
<td>CEIC</td>
</tr>
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<td></td>
<td></td>
<td>MUS</td>
<td>Import from US</td>
<td>CEIC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MJPN</td>
<td>Import from Japan</td>
<td>CEIC</td>
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<td>Export to Europe</td>
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<td>CEIC</td>
</tr>
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<td>XUS</td>
<td>Export to US</td>
<td>CEIC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>XJPN</td>
<td>Export to JPN</td>
<td>CEIC</td>
</tr>
<tr>
<td>4</td>
<td>Trade Link China</td>
<td>XC</td>
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<td>CEIC</td>
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<tr>
<td>5</td>
<td>Macro Prudential Policy</td>
<td>MPP</td>
<td>Macro Prudential Policy</td>
<td>Zhang &amp; Zoli ()</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The interaction of monetary and</td>
</tr>
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<td>Variables</td>
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</table>

Macroprudential policies—IMF ()

References


Monetary Policy Efficiency
Measurement of Its Efficiency in Indonesia

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Abstract
Since 2000, monetary policy in Indonesia has experienced significant changes over the implementation of Law 23 year 1999. Under the legislation, monetary policy in Indonesia started to use strategies ITF (Inflation Targeting Framework). The purpose of this policy is to stabilize the value of the rupiah through the BI rate determination to achieve inflation targeted. To evaluate the performance of the monetary policy base on the ITF strategy, it is required indicators for the success of the policy namely the efficiency rate.

ITF monetary policy strategy is a rule-based monetary policy. In the rule-based policy, the determination of the interest rate is determined using a specific formula. The formula of the interest rate determination is usually based on the equation of the
modified Taylor Rule. Theoretically, rule-based monetary policy supposed to be more efficient than discretion monetary policy. This is because in the rule-based monetary policy, interest rates was calculated based on the inflation targeted. Thus inflation is expected to be more stable so the policies more efficient.

In principle, the measurement of the efficiency of monetary policy was based on inflation and output variations. Monetary policy is considered to be efficient if the policy generates low fluctuation of output and inflation. Low and stable inflation will encourage the output growth in the long term, while high fluctuation of inflation will cause a social loss. Some economists have tried to formulate the monetary policy efficiency measures such as Cecchetti (2006) and Romer (2006). However, these formulations still in a general form and can not be used operationally. In this paper, the authors formulate a method for measuring the efficiency of monetary policy and applied to the data of inflation and output in Indonesia. The efficiency of monetary policy is measured by the deviation of actual monetary policy from ideal monetary policy. Ideal monetary policy is policy that creates a minimum variation of output and inflation.

The measurement results since the implementation of monetary policy based ITF, the efficiency of monetary policy has not changed significantly. However, there was a tendency to increase the efficiency of monetary policy after the full implementation of the ITF framework after 2005 than in the transition period 2000-2005. The full-fledged implementation of ITF will strengthen public expectation toward the decrease of inflation and encourage low and stable inflation.

*Keywords: monetary policy, inflation targeting framework, loss function, efficiency.*

*JEL Classification: E10, E31, E52*

1. **INTRODUCTION**
In the past few decades, policy makers around the world have become increasingly aware of the social and economic costs due to inflation. Economists and politicians have begun to discuss the costs caused by the high inflation since 1960 in which the world has been experiencing the rising inflation. Inflation may lead to uncertainty concerning relative prices and price rates in the future, which brings into companies and individuals to find if difficult to make a decision, and in turn, this lowers the economic efficiency consensus. Economists claim that inflation may harm economic growth, especially when the inflation is high level (Mishkin, 2007).

The awareness of high costs due to inflation lands to the viewpoint that low and stable inflation will encourage the productivity of economic resources and support economic growth, price stability becomes an important factor for the long term healthy economic growth. Therefore, price stability defined as low and stable inflation is regarded as the main goal of the monetary policy.

Relation to the matters, the central element which is necessary for the monetary policy is the use of a nominal anchor to be uses as a policy strategy. Nominal anchor is a nominal variable such as inflation, and money supply that could limit the movement of prices in order to achieve price stability. There are three monetary policy strategies that is nominal anchor determination (implicit nominal anchor), (Mishkin, 2007).

The monetary policy with an inflation target strategy has been widely adopted by many countries. New Zealand was the first country which implemented the strategy of the inflation targeting in 1990, followed by Canada in 1991, England in 1992, Sweden and Finland in 1993, Australia and Spain in 1994, followed by other countries such as Israel, Chile, and Brazil.

In Indonesia, the monetary policy with the nominal anchor began to be implemented along with the implementation of Act 23 year 1999 concerning Bank of Indonesia. In the legislation, it is stated that the task of Bank Indonesia is focused on keeping the rupiah value stable. In the implementation, Bank Indonesia is
obliged to determine the inflation targeted. Therefore, the monetary policy outlined in the Act 23 has implicitly detected that the monetary policy of meanwhile, in the explanation of Act number 23 year 1999. It is stated that the stability of rupiah and its reasonable exchange rate is part of prerequisites for achieving sustainable economic growth which in turn will improve the people’s welfare.

Since the use of BI rate for achieving the inflation target, inflation remained high and fluctuating. Figure 1. shows that in period of 2003 to 2015 there were of least five points of climax inflation and five points of anti climax inflation. During the period, the lowest inflation was at the rate of 2.41% occurring in November 2009 while the highest inflation was at the rate of 18.38% occurring in November 2005. The considerable difference between the highest and the lowest inflation rates show that the inflation fluctuation in Indonesia 13 still high. The inflation rate has still been high and fluctuating since the implementation of the monetary policy with the inflation targeting strategy should be paid attention to, considering that the purpose of the implementation of the policy is to meet the low and stable inflation rate.

Source: Bank Indonesia

Figure 1. The Rate of Inflation in the Period 2003-2015
A fairly large inflation fluctuation in Indonesia requires a method of evaluation to measure the accuracy of the method in achieving the targeted inflation. The indicators of the success of the monetary policy within the framework of the ITF are usually measured by counting efficiency. The efficiency monetary policy views the accuracy of the policy in achieving the inflation target. The accuracy is seen through how big the inflation deviation occurring from the inflation targeted. On the other hand, inflation has a tradeoff relationship with the output, where the output is also the goal of economic development. Therefore, in measuring the efficiency of the monetary policy, in addition to inflation variation, the output variation is also calculated. Therefore, the efficiency of the monetary policy is usually calculated from the output variation and the inflation variation.

There are several methods for calculating the efficiency of the monetary policy offered by economics Romer (2006) and Cecchetti et. al. (2006) are economists who have built a method for measuring the efficiency of monetary policy. In this study, the authors developed a method for measuring the efficiency policy based on a formula that had been previously established. Then the authors use the technique for measuring the efficiency of the monetary policy in Indonesia.

2. LITERATURE REVIEW
The purpose of the monetary policy in the ITF Framework is to achieve the inflation rate targeted. The success of the monetary policy is indicated by its capability in maintaining stable inflation, called efficiency. On the other hand, inflation has tradeoff relationship with the output. Several models of efficiency measurement have been made by economists such as Cecchetti et al. (2006), and Romer (2006). Basically the models of efficiency measurement was made by calculating gap between optimum loss function. That is minimum output and inflation variation with the actual condition of the inflation variation and output variation.

The efficiency measurement of the monetary policy is done in two phases. First, identifying the minimum loss function. The minimum loss functions is formed from the determination of
optimum interest rate. Further, identifying output and inflation variation. The gap between minimum loss function and actual condition indicates the degree of the efficiency of monetary policy. The smaller gap between the optimal and the actual monetary policy, the more efficient the monetary policy.

2.1 Optimal Interest Rate

The efficiency monetary policy is calculated by considering the inflation variation and the optimal output variation. Optimal output and inflation variation occurring in the interest rate results in the minimum loss function. Rodenbush and Svensson (Walsh, 2003:508-512 stated that the optimal monetary policy was given by the equation of output and inflation as follows.

$$ y_t = a_1 y_{t-1} + a_2 y_{t-2} - a_3 (i_t - E_{t-1} \pi_t) + u_t, \quad (1) $$

$$ \pi_t = \pi_{t-1} + \gamma y_t + \eta_t \quad (2) $$

From the equation (2) inflation expectation may be made into equation: $$ E \pi_{t+1} = \pi_t + \gamma E_t y_{t+1} $$ and inserted into the output equation, it is abstained:

$$ y_{t+1} = a_1 y_t + a_2 y_{t-1} - a_3 (i_t - \pi_t - \gamma E_t y_{t+1}) + u_{t+1} $$

$$ = \frac{a_1 y_t + a_2 y_{t-1} - a_3 (i_t - \pi_t)}{1 - a_3 \gamma} + u_{t+1} \quad (3) $$

If: $$ \theta_t = \frac{a_1 y_t + a_2 y_{t-1} - a_3 (i_t - \pi_t)}{1 - a_3 \gamma} $$

so output and inflation of period t+1 is:

$$ y_{t+1} = \theta + u_{t+1} \quad (4) $$

$$ \pi_{t+1} = \pi_t + \gamma \theta_t + \eta_t + v_{t+1} \quad (5) $$

Where: $$ v_{t+1} = \gamma u_{t+1} + \eta_{t+1} $$

The value function from the loss function is:
\[
L = \min_{\theta_t} E_t \left[ \frac{1}{2} \left( \lambda y_{t+1}^2 + \pi_{t+1}^2 \right) + \beta V (\pi_{t+1}) \right] \quad (6)
\]

Minimization of lost function with equation obstacle (4) and (5) is:
\[
L = \min_{\theta_t} E_t \left[ \frac{1}{2} \lambda (\theta_t + u_{t+1})^2 + \frac{1}{2} (\pi_t + \gamma \theta_t + v_{t+1})^2 + \beta V (\pi_t + \gamma \theta_t + v_{t+1}) \right] \quad (7)
\]

The First Order Condition is:
\[
(\lambda + \gamma^2) \theta_t + \gamma \pi_t + \gamma \beta E_t V_{\pi} (\pi_{t+1}) = 0 \quad (8)
\]
from envelope theorem, it is obtained:
\[
L = \pi_t + \gamma \theta_t + \beta E_t V_{\pi} (\pi_{t+1}) \quad (9)
\]
By multiplying the equation (8) by \( \gamma \), and being added to the equation (9), so it results in: \( \gamma V_{\pi}(\pi_t) = -\lambda \theta_t \). By withdraw the time one period and making expectation, \( \gamma \beta E_t V_{\pi} (\pi_{t+1}) \) can be eliminated from the equation (8) becoming:
\[
(\lambda + \gamma^2) \theta_t + \gamma \pi_t - \beta \lambda E_t \theta_{t+1} = 0 \quad (10)
\]
or:
\[
\theta_t = -\left( \frac{\gamma}{\lambda + \gamma^2} \right) \pi_t + \beta \left( \frac{\lambda}{\lambda + \gamma^2} \right) E_t \theta_{t+1} \quad (11)
\]
Optimal condition occurs in \( \theta_t = B \pi_t \). Optimal B value is:
\[
\beta \lambda \gamma B^2 + (\beta \lambda - \lambda - \gamma^2) B - \gamma = 0 \quad (12)
\]
Considering \( \theta_t = \frac{a_1 y_t + a_2 y_{t-1} - a_3 (i_t - \pi_t)}{1 - a_3 \gamma} \), this optimal monetary policy is:
\[
\hat{i}_t = \left( 1 - \frac{B (1-a_3 \gamma)}{a_3} \right) \pi_t + \frac{a_1}{a_3} y_t + \frac{a_2}{a_3} y_{t-1} \quad (13)
\]
2.2 Efficient Monetary Policy

Efficient monetary policy is a policy that minimizes loss as a side effect the implementation of a monetary policy. Monetary policy efficiency may be seen by comparing the actual monetary policy with the monetary policy efficiency frontier. The monetary policy efficiency frontier is reduced from the minimization of loss function for discretion monetary policy.

Loss function contains output and inflation variation like the equation (14). While \( \lambda \) is level of tolerance of the monetary policy maker, towards the output gap variation for keeping stable inflation. In other words, \( \lambda \) may be required as a preference level of monetary policymakers towards the output gap variation. Several economists gave the optimal value of \( \lambda \). McCallum (2000), Nelson (2000), and Jensen (2002) gave the value of 0.25 for \( \lambda \), while Roberts gave the value of 0.3 for \( \lambda \) (Walsh, 2003:517-533).

\[
L(\hat{\lambda}) = (1-\beta) \sum_{t=1}^{\infty} \beta^t (\lambda y_{t+i}^2 + \pi_{t+i}^2)
\]

The result of equation minimization (14) with many combinations of output and inflation variation add certain level of \( \lambda \) will from a tradeoff line between output and inflation variation as shown in Figure 2. The smaller the value \( \lambda \), the closer the tradeoff line to the point of origin (point 0). The monetary policy efficiency frontier for discretion policy will tangent the tradeoff line of output and inflation variation.
Figure 2. Monetary Policy Efficiency Frontier

Figure 2 illustrates monetary policy efficiency frontier. Every point at the curve represents output and inflation variation for every value of $\lambda$. The level of social marginal cost of output and inflation variation is $\lambda$ at the efficiency frontier which is also an indifferent curve. Clarida, Gali, and Gertler (1999) suggest: if shock has no correlation, the optimal policy will occur when the central bank preference equals the public preference or $\hat{\lambda} = \lambda$. But if shock has correlation, the optimal policy made is $\hat{\lambda} < \lambda$. 

The efficiency of monetary policy may be measured from the distance of the actual point of the output and inflation variation towards the monetary policy efficiency frontier. The closer the point observed with the efficiency frontier, the more efficient the monetary policy. In Figure 3, the degree of the efficiency of monetary policy can be measured from the distance of observed point A with the curve of the monetary policy efficiency frontier (Cecchetti et al., 2006:412; Mishkin dan Schmidt Hebbel, 2007:52).

Cecchetti et al. (2006) calculated a change of the monetary policy efficiency in an almost similar way. Cecchetti focused on the change of the monetary policy efficiency through a graphic method and mathematic calculation of loss function as a function of output and inflation variation by weighted the preference of $\lambda$ and $(1 - \lambda)$. The loss function can be written as follows:

$$
Loss = \lambda \text{Var}(\pi) + (1 - \lambda) \text{Var}(y), \quad 0 < \lambda < 1
$$

(15)

where: $\lambda = \text{parameter of central bank preference towards inflation variation}; \text{Var}(\cdot) = \text{inflation deviation squared from its target or}$
output deviation from potential output; \( \pi \) = inflation; and \( y \) represent the output.

Based on the loss function formed, the measurement of the macroeconomic performance can be formulated at the period of \( i (P) \) given by the equation:

\[
P_i = \lambda \text{Var}(\pi_i) + (1 - \lambda) \text{Var}(y_i)
\]

(16)

The optimal macroeconomic performance (\( S_i \)) is the economic performance resulting from the minimum \( P_i \), with \( S_i \):

\[
S_i = \lambda \text{Var}(\pi_i)^* + (1 - \lambda) \text{Var}(y_i)^*
\]

(17)

where \( \text{var}(\pi)^* \) and \( \text{var}(y)^* \) are inflation variance and output variance in the optimal condition. If \( \Delta S = S_2 - S_1 \) has a negative value, it indicates that the performance of the economy decreases.

To determine \( \text{var}(\pi)^* \) and \( \text{var}(y)^* \), we can see a homothetic shift of the original frontier curve outward tangent the performance point as shown in Figure 4. The optimal variance is the intersection point between original frontier and the line drawn from the original point to the performance point.

![Figure 4. Monetary Policy Efficiency Frontier (Original Frontier) and Performance Point](image)
The efficiency of the monetary policy is calculated from the distance of the actual performance toward the optimal performance. The inefficiency level for every period \(i\) is:

\[
E_i = \lambda [\text{Var}(\pi_i) - \text{Var}(\pi^*_i)] + (1 - \lambda) [\text{Var}(y_i) - \text{Var}(y^*_i)]
\]  

Then, the variable of monetary policy efficiency \(\Delta E\) is calculated, based on the proportion toward \(\Delta P\) that is:

\[
Q = \frac{\Delta E}{\Delta P}
\]  

Furthermore, the average inefficiency between two periods will be calculated by assumed that central bank chooses the interest rate minimizing the loss function that is minimizing deviation squared from the inflation and output of the average target. The average is formulated as follows:

\[
E(L) = E[\lambda (\pi_i - \pi^*_i)^2 + (1 - \lambda)(y_i - y^*_i)^2]
\]

Where \(\pi^*\) and \(y^*\) are the inflation target and the output target for every \(t\) taken from the average value, and \(\pi_i\) is the inflation level for every \(t\) taken from the average value.

### 3. MEASUREMENT FOR EFFICIENCY OF MONETARY POLICY

Monetary policy is considered to be efficient if the policy generates low fluctuation of output and inflation. Low and stable inflation will encourage the output growth in the long term. High fluctuation of inflation will cause social loss, in which model is called loss function. The equation of loss function is defined as follows: \(LF = \lambda(\text{inflation variance}) + (1 - \lambda)(\text{output variance})\). The symbol \(\lambda\), valued between 0 and 1, is level of tolerance of BI toward the inflation fluctuation, while the level of tolerance of BI toward the output fluctuation is \(1-\lambda\). Theoretically, output and inflation variation at time \(t\) is calculated toward the target value and its potential.
Efficiency is measurement for optimal policy in limiting the output growth in order that inflation is not to high for the purpose of output growth stability. Optimal policy is macro economic policy resulting in minimal loss function. The loss function used in this research is:

\[ Loss = \lambda \text{Var}(\pi) + (1 - \lambda)\text{Var}(y), \quad \text{where } 0 < \lambda < 1. \]

\( \text{Var}(\bullet) \) show deviation squared toward its target that is \( \text{var}(\pi) = (\pi - \pi^*)^2 \) and \( \text{var}(y) = (y - y^*)^2 \), where \( \pi \) and \( y \) are inflation and output. The inflation variability aversion uses is \( \lambda = 0.3 \) according to the recommendation of Cecchetti et al. (2006) for developing countries. The approach of Mc Callum (2000), Nelson (2000), and Jensen (2002) recommended preference quality for \( \pi \) is 1:0.25 (Walsh, 2003) or \( \lambda = 4 \), is not used in this research because the value is more suitable for developed countries. After \( \lambda \) is determined, efficiency analysis can be continued.

In this research, this efficiency that will be measured is the efficiency variable between two periods. The first period is the period before pure ITF is used or FFIT (Full Fledged Inflation Targeting) in 2001 (I) up to 2005 (II). The second period was the period sure ITF was implemented or FFIT in which only one nominal anchor had beed used that is the inflation occurred in 2005 (III) up to 2008 (IV).

Stages of analysis are as follows:

1. In each period, determine the least loss function value from the actual data in Indonesia by using \( \lambda = 0.3 \) in all quarter in the related period.

2. Forming original frontier. The curve was derived by changing the value of \( \lambda \) with the minimal loss function value derived at the stage 1. Some pair combinations of \( \text{var}(\pi) \) and \( \text{var}(y) \) are derived as a result of value \( \lambda \). Plotting \( \text{var}(\pi) \) in vertical axis and \( \text{var}(y) \) in horizontal axis will from a curve of indifference or curve of efficiency frontier, in which stage is called the curve of original frontier (This curve has social MRS = \( \lambda/(1-\lambda) \)). To improve the formation of the curve of efficiency frontier to be
steeper, it may be done by a simple regression of $\text{var}(y)$ toward $1/\text{var}(\pi)$ as follows:

$$\text{Var}(y) = \beta_0 + \beta_1 \left( \frac{1}{\text{Var}(\pi)} \right) + \varepsilon$$

If $\beta_1$ significant ($\beta_0$ is not significant), the curve original frontier can be formed from $\text{Var}(y) \times \text{Var}(\pi) = \beta_1$.

3. In each period $\text{var}(\pi)^*$ and $\text{var}(y)^*$ are graphically searched for. The variation is obtained from the tangency point between the lines drawn from the original point to the performance point as shown in Figure 4.

4. Calculating $P_i$ and $S_i$

$$P_i = \lambda \text{Var}(\pi_i) + (1 - \lambda) \text{Var}(y_i)$$

$$S_i = \lambda \text{Var}(\pi_i)^* + (1 - \lambda) \text{Var}(y_i)^*$$

where $P_i$ is economic performance and $S_i$ is inflation and output variation in the optimal condition. $P_i$ and $S_i$ is calculated once each for every period of $i$ by taking the average of $\pi_i$ and average $y_i$ in each period.

5. Calculating $E_i$ and $\Delta E$

$E_i$ is a difference of $P_i$ and $S_i$ are $E_i = P_i - S_i$ or it can be calculated by a formula as follows:

$$E_i = \lambda [\text{Var}(\pi_i) - \text{Var}(\pi_i)^*] + (1 - \lambda) [\text{Var}(y_i) - \text{Var}(y_i)^*]$$

Then it is calculated:

$$\Delta E = E_1 - E_2$$

The value of positive $\Delta E$ indicates an increase or gain of monetary policy efficiency.

6. Calculating $Q$

$$Q = \frac{\Delta E}{|\Delta P|}$$

The positive value of $\Delta P$ indicates an increase or gain in macro economic performance (performance gain). Value of $Q$
indicates the efficiency variable of the monetary policy. The value of positive Q indicates that the monetary policy is getting more efficient. If \( \text{var}(\pi) \) indicates inflation variable or \( \text{var}(y) \) indicates output variable, correlating between periods and is statistically significant, the optimal policy is implemented in condition \( \hat{\lambda} < \lambda \) (Walsh, 2003:533). This research takes \( \lambda < 0.3 \).

4. THE EFFICIENCY OF MONETARY POLICY IN INDONESIA

4.1 Measurement of the Efficiency of Monetary Policy

In this part, the efficiency of monetary policy will be calculated in the first and the second period. The first period is the period before ITF was fully used or FFIT (Full Fledged Inflation Targeting) in 2001 (I) to 2005 (II). The second period was the period after ITF was fully implemented or FFIT where only one nominal anchor had been used, that is the inflation occurring in 2005 (III) to 2009 (III). The stages of analysis are explained below.

*Determining the least loss function*

The value of \( \lambda \) for calculating loss function is determined through several methods ie: determined by central bank, choosing the value of \( \lambda \) recommended, or calculated. According to the method of Cecchetti et al (2006) that country with high inflation can be uses the value of \( \lambda = 0.3 \); and \( \lambda = 0.8 \) for developed countries (The countries with low inflation). In Indonesia the quarterly inflation during, the research period was 2 percent on the average, this rate was considered high. Therefore, in this model of efficiency the value of \( \lambda = 0.3 \) is applied. With \( \lambda \) being mentioned, the value of loss function was chosen from the actual data in Indonesia in the whole quarter for each of the first and the second period. In the first period, the minimum loss function value was 0.4393 occurring in 2005 (II) and the loss function in the second period was 1.009 occurring in 2007 (II).
**Forming the original frontier curve**

The curve of original frontier is derived by change the value of $\lambda$ with the minimal loss function obtained from the first stage. Several pair combinations of $\text{var}(\pi)$ and $\text{var}(y)$ are derived as a result of value $\lambda$. Plotting $\text{var}(\pi)$ in vertical axis and $\text{var}(y)$ in horizontal axis will from a curve of indifference or curve of efficiency frontier, in this stage is called the curve of original frontier. There are two curves of efficiency frontier that are for the first and the second period.

![Original Frontier Curve of the First Period](image)

**Figure 5. Original Frontier Curve of the First Period**

The original frontier curve is symmetrical to the origin. The curve of original frontier can be seen in Figure 4. To improve the formation of the original frontier curve to be more accurate, it may be done by a simple regression of $\text{var}(y)$ towards $1/\text{var}(\lambda)$ as follows:
This regression equation is required to seek \( \text{var}(\pi)^* \) dan \( \text{var}(y)^* \) in the third stage. Followed by the formation process of original frontier for the second period. Below is a figure of pairs of \( \text{var}(y) \) and \( \text{var}(\pi) \) in the minimal loss function of the second period as input to make the original frontier in this period.

Like the first period, in \( \lambda = 0,5 \) (the value of tolerance of output and inflation in the equation of loss function) had the same strength, the value of \( \text{var}(y) \) was the same as the value of \( \text{var}(\pi) \). This shows that the original frontier curve is symmetrical to the origin. The original frontier can be seen in Figure 5.

To improve the formation of the original frontier curve to be more accurate, a simple regression of \( \text{var}(y) \) toward \( 1/\text{var}(\pi) \) can be done as follows:

\[
\text{Var} (y) = \beta_0 + \beta_1 \left( \frac{1}{\text{Var}(\pi)} \right) + \varepsilon
\]

\[
\text{Var} (y) = 0,030 + 0,903 \left( \frac{1}{\text{Var}(\pi)} \right) + \varepsilon
\]

This regression equation is required to seek \( \text{var}(\pi)^* \) dan \( \text{var}(y)^* \) in the third stage.
Searching Optimal Variance

Optimal variance is symbolized by \( \text{var}(\pi)^* \) and \( \text{var}(y)^* \), that is intersection point between lines drawn by origin point to the performance point. Performance point is the average \( \text{var}(\pi)^* \) and \( \text{var}(y)^* \) in each period. In the first period, the average \( \text{var}(\pi)^* = 1.07 \) and average \( \text{var}(y)^* = 36.30 \), while in the second period, \( \text{var}(\pi)^* = 5.03 \) and the average \( \text{var}(y)^* = 33.63 \). The value of \( \text{var}(\pi)^* \) and \( \text{var}(y)^* \), according to Cecchetti et. al., could be done graphically; but in this research, seeking \( \text{var}(\pi)^* \) and \( \text{var}(y)^* \) was done mathematically. This mathematic way is done in order to get a more accurate result.

Figure 7 is seen that the performance point \((P_1)\) is higher compared with \(P_2\). This means that there is an increase in the macroeconomic performance of Indonesia from the first period to the second period. In the figure mentioned above it is also shown
that $E_1$ is bigger than $E_2$ indicating that the efficiency of monetary policy is increasing. From the first period to the second period. Comparing $P_1$ with $P_2$ or $E_1$ with $E_2$ can only be done with the condition of constant $\lambda$, if $\lambda$ of the first period is difference from the seconds period, $P_1$ and $E_1$ cannot be compared with $P_2$ and $E_2$. In this research the value of $\lambda$ mentioned above is 0.3 both in the first and in the second period. The decrease in the value of $P_2$ compared with $P_1$ indicates that the macroeconomic performance increases due to the ITF implementation, that is the inflation determination as target of monetary policy.

![Figure 7. Original Frontier and Loss Function Curve of the First and the Second Period](image)

**Figure 7. Original Frontier and Loss Function Curve of the First and the Second Period**

Figure 7 shows that the line drawn from the origin to the performance point rotates to the right. This indicates that the BI preference toward inflation in full implementation of ITF is relatively decreasing as compared with the implementation of transitional ITF. In period of full implementation of ITF, the average inflation fluctuation between quarters is bigger as compared with the period in the implementation of transitional ITF, but is output fluctuation is smaller as compared with the transitional period. Overall, social loss function in the period of full application of ITF is smaller compared with the previous period. The increase in inflation fluctuation and the decrease in output fluctuation in the full application of ITF (after July 2005)
can be understood because the implementation of inflation target does not mean to ignore the output and its stability, there is still a space of flexibility in the implementation of ITF like a gradual program on disinflation and a flexible operational design (Pohan, 2008). The implementation of ITF in Indonesia follows the basic principles that ITF is a framework, not a rule. The implementation of the monetary policy also considers a wider development target, among other things is economic growth. Unlike the principle of full discretion, ITF require that discretionary policy in the implementation of the monetary policy is restricted.

After inefficiency of monetary policy (E) is known then \( \Delta E \) is calculated to know the efficiency variable (Q): \( \Delta E = E_1 - E_2 = 23,886 - 23,241 = 0,645 \).

The amount of \( \Delta E \) is scale (not vector). The positive value of \( \Delta E \) indicates an increase in the efficiency of monetary policy.

**Calculating The Efficiency Variable (Q)**

The change of efficiency is the ratio of change in efficiency to performance gain, that is:

\[
Q = \frac{\Delta E}{|\Delta P|}
\]

\[
Q = \frac{0.645}{0.681} = 0.947
\]

The value of Q indicates the efficiency of monetary policy. The value of Q in this research is 0.947 (positive), this indicates that monetary policy is getting more efficient.

4.2 Analysis of Monetary Policy Efficiency

The result of this efficiency analysis indicates that the efficiency of period two (after ITF is fully implemented) is higher than the efficiency of period one (before ITF is fully implemented). By using inflation target strategy, output and inflation fluctuation
become small indicating that output and inflation are relatively low and stable since ITF fully implemented.

With the inflation target being determined by BI, inflation expectation will get close to or the same as the inflation target of Bank of Indonesia by $\pi_{t+1}$, or it applies to $E_t \pi_{t+1} = \pi_{t+1}$. So bias between public inflation expectation and inflation target is getting small or zero, which in turn, will decrease the inflation fluctuation. Furthermore, the decrease in inflation fluctuation, bends to encourage the decrease in gap between actual output and potential output (output in full employment). Therefore, monetary policy becomes more efficient.

On the other hand, the decrease in inflation fluctuation will make social less function smaller. This relationship is illustrated in model of Money in the Utility Function (MUF), where inflation relationship with loss function is positive (Walsh, 2003). The higher the inflation fluctuation the bigger the social loss function. On the contrary, the lower the inflation, the smaller the social loss. The result of the analysis of monetary policy efficiency indicates that the efficiency is getting bigger which means that the social loss is getting smaller.

In Indonesia, the monetary policy with ITF strategy has been applied since 2000. This policy has only one, single target that is inflation. This is different from the policy which was applied before 2000 that is monetary targeting which had a multiple target.

But in the beginning of the application of ITF policy, banking condition in Indonesia was not yet completely stable so the transmit slow of the monetary policy in the framework of achieving: the inflation/target had not worked out well. Observation on transmission mechanism was not an easy job. While in the ITF implementation, the running of this transmission mechanism played an important role considering the mandate given to achieve the stability of prices. In the condition like this, the increase in the interest rate of monetary instrument (SBI) to absorb cartel money to go back to the banking system was after late due to the response of deposit interest rate so to encourage
the incoming of cartel money to banking system required of the increase in the interest rate which was higher than it should have been.

Nevertheless, the obstacle mentioned was not a specific obstacle for the application of inflation target framework, because basically, monetary policy with any framework requires the presence of a healthy financial system so that the target achievement becomes credible. A mature preparation is required so timer in applying the inflation target framework, BJ can increase inflation prediction accuracy and understanding of the monetary policy transmission in Indonesia. This preparation is required for the application of full inflation target framework.

The ITF approach has advantages compared with the monetary targeting approach. With ITF, the monetary policy may focused better on domestic issues and respond immediately every shock occurring in domestic economy. Stability of relations between monetary aggregates and inflation is not a very important issue as the success of policy does not depend on the relation mentioned above. The ITF approach enables monetary authority to use all the information available in determining the policy direction that will be taken. In addition, with ITF the public may understand easily the policy direction that has been taken due to the presence of transparency of the policy taking process and the increase in central bank accountability with regard to the explicit inflation target announcement to the public. The ITF approach may also avoid the possibility of central bank to be trapped under politic pressure. Central bank may carry out the monetary policy independently.

The ITF approach in the monetary policy implementation in several developed countries generally noted a success stories. In Indonesia, the full-fledged implementation of ITF by leaving monetary targeting in practice had just begin since the middle 2005. The observation on empirical data in Indonesia indicated that the inflation fluctuation and the output fluctuation were relatively small since the full-fledged application of ITF. From the
result of this research the monetary policy efficiency in Indonesia on the full-fledged application of ITF (Romer's Method) was higher than the monetary policy efficiency before the full-fledged application of ITF was used. Unfortunately the increase in the efficiency was not significant. This means that a longer period is required an order that is shifting from the monetary targeting to ITF can run well. The time passed was too short to evaluate significantly whether or not the policy implementation taken was successful.

The performance of Bank Indonesia to minimize the inflation and output fluctuation was relatively successful. The credibility of Bank Indonesia in controlling the inflation has begun to get better and the inflation tends to decline. The full-fledged implementation of ITF will strengthen public expectation toward the inflation decrease and speed the disinflation program being carried out. This in turn, will increase the credibility of Bank Indonesia in controlling the inflation. In addition, the inflation target containing the element of good governance for a modern central bank likes goal clarity, the transparency and accountability are parallel in the effort of Bank Indonesia to increase the credibility in the implementation of ITF.

Consistence and more focus are paying close attention to the inflation are expected to encourage the output growth in a long term. The session result of board of governors of Bank of Indonesia in April, 2010 stated that Bank Indonesia had to maintain reference interest rate (BI rate) at the level 6,5 percent was expected to be successful. The BI rate at this level is expected to be conducive to strength the economic recovery process, maintain the financial stability and encourage banking intermediation. The decision to maintain the BI rate at the level 6,5 percent was based on the evaluation result of the economic performance during the trimaster 1 in the year 2010.

5. CONCLUSION

The efficiency of monetary policy can be measured by calculating the distance of performance point to the original frontier curve. Performance point is the average variance of inflation and the
average variance of the output gap, while the original frontier curve is a curve obtained by varying the \( \lambda \) at the minimum loss function, where the value of \( \lambda \) is the degree of tolerance of Bank Indonesia to the inflation fluctuations.

This efficiency measurement method was applied to the data of Indonesia during the transitional ITF implementation period 2000-2005 and full implementation period 2005-2009. Since the monetary policy was fully implemented with the ITF on July 2005, there has been a tendency that the monetary policy efficiency increased as compared with the ITF application in the transitional period in 2000 to 2005. The monetary policy with full-fledged ITF application resulted in lower costs (inflation fluctuation and output fluctuation). This is due to the fact that the ITF policy is a set framework, starting from the instrument used, target to the policy goal.

REFERENCES


Monetary Policy

Its Role to Comparative Advantage of Capital Intensive Industry In Indonesia

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Abstract
The purpose of this paper is to examine the effect of monetary policy to comparative advantage of capital intensive industry (technology-intensive industry and human capital-intensive industry) in international trade. Ever since Indonesia implemented inflation targeting policy (ITF) in 2005, the average interest rate gradually down than before.

The lower interest rates lead capital more affordable in Indonesia. Heckscher-Ohlin (H-O) model states countries with comparative advantages should export goods that require factors of production that they have in abundance. This study used annual data exports and imports three-digit the standard international
The study used analytical tool by combining two fundamental Revealed symmetric comparative advantage (RSCA) index by Laursen (1998) and Trade balance index by Lafay (1992) that analyzed used products mapping by Widodo (2008). The study also used double difference (DD) model to measure real impact of ITF to capital intensive industry. We use unskilled-labor intensive products as control group in DD model since it is assume not significantly influence by interest rate.

Based on product mapping, the condition is better in 2000 than 2014, in era ITF. However, DD explain the worse is not cause by ITF. The DD shows the ITF have positive impact to comparative advantage and trade balance of capital-intensive products.

**Keywords:** Monetary Policy, Interest rates, International trade, Comparative advantage

**JEL Classification:** E52, E4, F4, N7

### 1. INTRODUCTION

Not only in Indonesia, monetary authority in various countries have justified the adoption of short-term interest rate as their operational target rather than monetary aggregate. Therefore, policy models started to set aside the relationship between money supply and inflation, and started to focus on the relationship between interest rate and inflation. This phenomenon was reviewed by MacCallum and Nelson (2010) who have shown that most publications which contributed to monetary handbook are minimizing the role of monetary aggregate in the theory and analysis of monetary policy.

Bank Indonesia officially run inflation targeting framework (ITF) on July 2005. However, the socialization ITF has been done since 2001. Based on Taylor rule, the monetary authority can influence inflation using short run interest rates. Furthermore, the
decline of interest rates should be increase competitiveness of capital-intensive industries. Based on the model of Heckscher–Ohlin, the country will export goods that use factor of production relatively abundant. Consequently, the lowering the interest rates should be increase comparative advantage and improve trade balance of capital-intensive industry.

Movement of interest rates for investment loan of state and commercial bank from 1990-2014 can be seen in Figure 1. It can be seen that the interest rate of investment in 1990 and 1993 is nearly 20% per year. Furthermore, interest rates fall to 15% from 1994 to 1997 but rise again in 1998 and 1999 above 20% due to the monetary crisis. The interest rate gradually felt after 2000 and continue decline until 2015.

![Figure 1. Interest Rate of Investment Loans (%)](image)

Source: Bank Indonesia

**Figure 1. Interest Rate of Investment Loans (%)**

Figure 2 shows the monthly interest rate movements after the implementation of the ITF in 2005. The investment loan interest rates are move along with the policy rate. It should lower interest rates after the implementation of ITF that advantageous for capital intensive industry since the cost of capital becomes cheaper. Hickser-Ohlin model states that the country will export products that use intensively capital abundant factor of production and import product that uses intensively scare factor of
production. The question is, whether the application the ITF that cause lower interest rates improve comparative advantage and trade balance for capital-intensive products in Indonesia.

![Figure 2. Interest rate of investment loans and SBI after ITF (%)](image)

2. LITERATURES

Monetary policy is used to stabilize price and output level used short run interest rates as operational target. The relationship between interest rate and inflation can be explained though taylor rule. Taylor rule explains how much the central bank may need to changes the current interest rate when inflation, output level, and other economic condition change. On the equation 1, $i_t$ is short run nominal interest rate, $\pi_t$ is inflation, $r_t^*$ is assumed as rill interest rate equilibrium, $y_t$ is logarithm from real GDP, $\bar{y}_t$ is logarithm from potential output.

$$i_t = \pi_t + r_t^* + a_\pi (\pi_t - \bar{\pi}_t) + a_y (y_t - \bar{y}_t) \quad (1)$$

Interest rate policy can stimulate production level of output (Ridhwan, 2010, Barth III & Ramey, 2002) through increase of comparative advantage (Bergin & Corsetti, 2008 & 2014). The use of capital increase when interest rate decreases (Jorgenson, 1963). Jorgenson (1963) express that interest rate increase investment through the reduction of the cost of capital. Moreover, Chetty (2007), specifically express that investment is
the backward-bending function from interest rate. Peng & Thibodeau (2016) empirically analyze non-monotonic of changes in the interest rate on irreversible investment used dataset 1416 individual capital improvement of big firm like apartment, industrial and retail properties, for period 1978-2009 found that the effect non-monotonic is capture from interactions between interest rate with capitalization level from property firm. In contrast to studies which found that interest rate gives negative effect on capital and investment, Capozza and Li (2001) were used data of 56 metropolitan housing for period 1980-1989 found that investment level gives positive effect to interest rate.

Furthermore, companies need input or factors of production, which in simply term is capital and labor. Heckscher–Ohlin model explain that each countries have the difference in proportion of factor of production cause the difference in the good price. It makes country specialize produce goods that used intensively abundant factor of production and competitive advantage.

The increase of capital will rise output and net export of capital-intensive products. Rybczynski theorem express that the increase in the supply on one factor of production factor will increase output but can decrease other output (Akay & Dogan, 2013, Hanson & Slaughter, 1999). However Bernstein & Weinstein (2002) found other conclusion. Akay and Dogan (2013) was used US data for 1979-2001, found that the increase on labor supply rise output in all industry but the magnitude is depend on elasticity on each industry. The same with Akay and Dogan (2001), Hanson and Slaughter (1999) was used OLS method, and 40 sectors in US period 1980-1990, found that there are linear relationship between labor supply and the change of output mix in US.

There are previous research which found the effect of interest rate on competitive advantage. Bergin and Corsetti (2014) used New Keynesian model prove that monetary policy can increase comparative advantage firm. Bergin and Corsetti (2008) express that the decrease on interest rate will increase expected
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advanced in group of products. However, $RCA_h^A$ less than zero
$RCA_h^A$ greater than zero implies that country has competitive

The values of $RCA_h^A$ index has value between minus one to one:

$$RCA_h^A = \frac{h(1 - h) + RCA_h}{1}$$

index is formulated as follows:

(1)

(2)

We use Revealed Symmetric Comparative Advantage

Later classification 5 and 6, the procedure comparing the group
discussion 5 and 6, and the procedure comparing the group

The research uses technology-intensive product and human

SITC, the classification table is available upon request.

industries (62 SITC), and human capital-intensive industries (43

h) technology-intensive industries (26 SITC), technology-intensive

SITC, manual resource-intensive industries (21 SITC), unskilled

SITC, primary industries (83 SITC), human capital-intensive industries

follows, the products or industries. However, unskilled labor

The procedure comparing the group discusses later.

We use Revealed Symmetric Comparative Advantage.

The values of index has value between minus one to one.

greater than zero implies that country $i$ has competitive

less than zero implies that country $i$ has competitive

3. METHODOLOGY

policy influences output, productivity, and export and import.

In contrast, Bergin and Corsetti (2014) use US data as home

country and aggregate of 10 EURO countries as foreign country

discounted profit by create new firm, so that encourages new firm

from 1972-2004, found that with stabilizing markup, monetary

policy can foster competitiveness of firm, encourage investment

from 1972-2004, found that with stabilizing markup, monetary

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We use UN COMTRADE to measure comparative advantage and trade balance.

We use UN COMTRADE to measure comparative advantage and trade balance.

We use Revealed Symmetric Comparative Advantage.
means that country $i$ has comparative disadvantage in group of products $j$.

Furthermore, RCA in equation (2) is Revealed Comparative Advantage index or Balassa index (Balassa, 1965). RCA index is formulated as follows:

$$RCA_{ij} = \frac{X_{ij}}{X_{in}} \left( \frac{X_{wj}}{X_{wn}} \right)$$

where $RCA_{ij}$ represents revealed comparative advantage of country $i$ for group of products (SITC) $j$; and $X_{ij}$ denotes total exports of country $i$ in group of products (SITC) $j$. Subscript $w$ refers to all countries and subscript $n$ refers to all groups of products (SITC).

The other indicator analyze trade balance index (Lafay, 1992) to analyze whether a country has specialization in export (as net-exporter) or import (as net-importer) for specific group of product (SITC). TBI is formulated as

$$TBI_{ij} = \frac{x_{ij} - m_{ij}}{x_{ij} + m_{ij}}$$

where $TBI_{ij}$ denotes trade balance index of country $i$ for group of products (SITC) $j$; $x_j$ and $m_j$ represents exports and imports of group of products $j$ by country $i$, respectively. Furthermore, this index ranges from minus one to one. When TBI equals to minus one means a country only imports, in contrast, the TBI equals to one means a country only exports.

Tri Widodo (2008) use the RSCA and TBI indexes to constructed the “products mapping”. He categorized product into four groups A, B, C and D as depicted in Figure 3. Group A consists of products which have both comparative advantage and export-specialization; Group B consists of products which have comparative advantage but no export-specialization; Group C consists of products which have export-specialization but no comparative advantage; and Group D consists of products which have neither comparative advantages nor export-specialization. In region A, there are potential products.
Furthermore, Widodo (2008) explain the industries in the first round of the FG pattern are unskilled labor-intensive industries followed by human capital-intensive industries in the second round and technology-intensive industries in the third round.

Furthermore, the impact of the ITF influencing the comparative advantage index and trade balance index is estimated using difference in the difference model or double different (DD). This model is used to see the effects the government policies on society. In the DD models, the data comes from two groups of units of analysis that have the same characteristics. Example, A group that impacted by policy (of participants) and group B who does not impacted by policy (control). In this study a group of products affected by the ITF are capital intensive products and control group that is not effected is unskilled labor intensive products.

Sources: Khandker, et al. (2010)

**Figure 4. Reason for DD Model**
Figure 3 shows the researchers assumed that the distance between the groups of products, B and A at the time before the ITF or \( t_0 \) is \((Y_1 - Y_0)\), where \( Y \) is RSCA or TBI index. The distance of RSCA and TBI will be the same at the next measurement \( t_1 \) when there is no ITF. The model shows without ITF policy which tends ITF the distance is \((Y_3 - Y_2)\). The distance between \( Y_3 \) to \( Y_4 \) is impact of the ITF policy. Khandker et. al. (2010) also state the advantage of DD is relaxes the assumption of conditional selection only on observed characteristics. It also provides a tractable, intuitive way to account for selection on unobserved characteristics.

Based DD, this study use Ordinary Least Square (OLS) to investigate the causality relationship between ITF and capital intensive products. In the model, 2000 used as time before the policy and 2014 used as the time in policy. Furthermore, unskilled labor-intensive product is used as control variable. White heteroskedasticity-consistent standard errors & covariance apply and model can be formulated as:

\[
RSCA_{it} = \beta_0 + \delta_0 d14_{it} + \beta_1 dtech_{it} + \delta_1 d14_{it} * dtech_{it} + e_{it}
\]

\[
TBI_{it} = \beta_0 + \delta_0 d14_{it} + \beta_1 dtech_{it} + \delta_1 d14_{it} * dtech_{it} + e_{it}
\]  

(5)

where \( d14 \) is dummy 2014 (period of policy) and \( dtech \) is dummy technology-intensive products. The equation 5 use to estimate ITF effect to technology-intensive products. Furthermore, the DD for human capital-intensive products estimated using the following equation:

\[
RSCA_{it} = \beta_0 + \delta_0 d14_{it} + \beta_1 dhum_{it} + \delta_1 d14_{it} * dhum_{it} + e_{it}
\]

\[
TBI_{it} = \beta_0 + \delta_0 d14_{it} + \beta_1 dhum_{it} + \delta_1 d14_{it} * dhum_{it} + e_{it}
\]

(6)

Where \( dhum \) is dummy human capital-intensive products. In DD, coefficient \( \delta_1 \) is important because it measures the real effect of ITF on RSCA and TBI. The coefficient exclude the other effect that influence RSCA and TBI that assume effected treatment group, technology-intensive or human capital-intensive products, and control group, unskilled-labor intensive products.
4. RESULT AND DISCUSSION

4.1. Product Mapping

Figure 5 shows products mapping for unskilled labor-intensive products in 2000, before ITF, and 2014. The number of potential products, the region A in the products mapping, is decreasing for unskilled labor-intensive products. Since we assume unskilled labor-intensive industry is not affected by interest rates, the decline is caused by other factors beyond the ITF policy. The significant change exist in TBI where many products that were previously located in the region A and C in 2000, have positive net exports, move to the region B and D. The number potential products in region A also reduce move to other region. The products in region D, have comparative disadvantage and net exports negative, also increase in 2014.

Source: UN-COMTRADE, author calculation

Figure 5. Product Mapping for Unskilled Labor-Intensive Products

Figure 6 shows product mapping for technology-intensive products in 2000, before ITF, and 2014. The number of potential
products, the region A in the product mapping, is decreasing from 6 to 4 products. The significant change exist in TBI where many products that were previously located in the region C in 2004, have comparative disadvantage but positive net exports, move to the region D, have comparative disadvantage and net exports turned negative.

![Product Mapping for Technology-Intensive Products](image)

Source: UN-COMTRADE, author calculation

**Figure 6. Product Mapping for Technology-Intensive Products**

Figure 7 shows products mapping for human capital-intensive products in 2000, before ITF, and 2014. The number of potential products, the region A in the product mapping, also change from 10 to 8 products. Furthermore, different than unskilled-labor intensive and technology-intensive products, the product in region C still same in both year.
Based on products mapping, there are other similarities in each group, several products leave region A. There is more unskilled labor-intensive products move leave region A rather than other groups. Furthermore, there is more technology-intensive products move leave region C rather than other groups. The change of human capital-intensive industry better than other group since only 2 products leave region A and number of products in region C still same. However, based on products mapping, the condition is better in 2000 than 2014. Based products mapping, there is question, whether the condition is caused by ITF which lower inflation and interest rates or it due to factors beyond the monetary policy. Since it difficult to exclude the effects of non-ITF factor in common model, we use DD to estimate the only ITF impact to capital intensive products.
4.2. Difference in difference (DD) estimation

Table 1 shows DD estimation for RSCA and TBI for technology-intensive and human capital-intensive products. The constant of equations show the RSCA and TBI for unskilled labor-intensive products. All of coefficients are positive but not significantly different than zero. The positive coefficient means the products have comparative advantage and positive net export in average but insignificant coefficients tell us the positive sign are statistically not different than zero. Furthermore, we can see coefficient \( d14 \) significant for all equation and negative. The coefficient show us the comparative advantage and trade balance for technology-intensive and human capital-intensive products is worse than 2000.

Coefficient dummy of technology-intensive products, \( dttech \), shows the comparative advantage of it is worse than unskilled labor-intensive products. The coefficient in TBI equation show the net export for it is also worse than unskilled-intensive products. Furthermore, the coefficient dummy of human capital-intensive products, \( dhhum \), is negative but only for RSCA significant. The coefficients tell us the comparative advantage of human capital-intensive products is lower than unskilled labor-intensive products but the trade balance is statistically not different. The results show Indonesia have better comparative advantage and trade balance in unskilled labor intensive products than other capital intensive group of products.

<table>
<thead>
<tr>
<th>Technology-Intensive Products</th>
<th>Technology-Intensive Products</th>
<th>Human Capital-Intensive Product</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RSCA</td>
<td>TBI</td>
</tr>
<tr>
<td>Constanta</td>
<td>0.1253</td>
<td>0.1594</td>
</tr>
<tr>
<td>( d14 )</td>
<td>-0.2079***</td>
<td>-0.373**</td>
</tr>
<tr>
<td>( dttech )</td>
<td>-0.653*</td>
<td>-0.497**</td>
</tr>
<tr>
<td>( d14 \times dttech )</td>
<td>0.2455***</td>
<td>0.195</td>
</tr>
<tr>
<td>( dhhum )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( d14 \times dhhum )</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Significant at the level of significant * 1%, ** 5%, *** 10%
The DD coefficient for technology-intensive products, $d14 \times dtech$, explains the ITF have significantly positive impact on comparative advantage and positive but not significant impact on trade balance of capital-intensive products. Furthermore, the ITF also have positive but not significant impact on comparative advantage as well as trade balance for human capital-intensive products. The result tell us the ITF that lower interest rate increase comparative advantage for capital intensive industry, especially technology-intensive industry, but does not significantly increase export of product.

5. CONCLUSION

ITF policy aimed at reducing inflation using interest rates as operational targets. ITF in Indonesia, that socialize since 2001 and formally executed in 2005, gradually reduce inflation by lowering the policy interest rate (SBI). The decline of SBI also accompanied by a decrease in interest rates on loans for investment and should favor capital intensive industry. In international trade perspective, the lower interest rates should increase comparative advantage for capital intensive industry that will impact better trade balance.

ETA group product based on the factor of productions used intensively in production. We investigate the ITF impact to comparative advantage and trade balance of technology-intensive and human capital-intensive products use products mapping and DD. We use unskilled-labor intensive products as control group in DD model since it is assume not significantly influence by interest rate. As control group it also assume effected by factor excluded ITF same like capital intensive groups.

Based on product mapping, the condition is better in 2000 than 2014, in era ITF. However, DD explain the worse is not cause by ITF. The DD coefficient that measure real effect of ITF shows the ITF significantly increase comparative advantage of technology-intensive products. The worse condition is influenced by other factor. The ITF increase comparative advantage significantly for technology-intensive product. The ITF also increase but statistically insignificant trade balance of technology-intensive products and comparative advantage as well
as trade balance for human capital-intensive products. This study concludes the ITF have positive impact on capital-intensive products.

REFERENCES


Trilemma Policy
and Economic Growth Stability in Southeast Asia

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Abstract
Trilemma is the limitation of a country to simultaneously attaining three condition at the same time namely fixed exchange rate, independent monetary policy and free capital mobility. Accordingly, this paper tries to investigate what is the best policy to be imposed by central bank to achieve higher economic growth amid financial crisis based on experiences of Southeast Asia countries. To measure trilemma, this paper uses balanced panel data approach from Indonesia, Thailand, Philippines and Malaysia during the period of 1980 to 2013. This paper includes trilemma index as independent variable alongside with inflation, openness and foreign currency reserve in explaining the variance of economic growth. Based on estimation result, it is found that during global financial crisis, exchange rate stability and financial openness policies induce higher economic growth compared to
monetary independence as indicated by negative coefficient of monetary independence index. Nonetheless, those three policies are not statistically significant improving economic growth during East Asian financial crisis in 1997.

*Keywords: trilemma; economic growth; Southeast Asia; financial crisis*

*JEL Classification: F31, F32, F36*

1. INTRODUCTION

Trilemma, or impossible, trinity can be defined as the limitation of a country to simultaneously target the exchange rate, acquire independent monetary policy, and full financial integration at the same time (Aizenman and Sengupta, 2012). It occurs due to the lack of policy maker to achieve interest parity when they want to implement all of those three policies. Therefore, policy maker has to face such trade-off in designing its macroeconomic goals. Policy maker has only two maximum options: 1) to promote one of the three goals or 2) to combine two policies at the same time. The decision is being determined by domestic interest at the country level. However, rapid growing of globalization, in terms of trade and finance, has created several challenges for policy maker to deal with those macroeconomic goals in dynamic way. Moreover, financial turbulence as a result of financial openness circumstance has lead policy maker to choose different combination of policy at different environment.

One of good example to study the effect of those macroeconomic management policies under impossible trinity is by analyzing the experience of Southeast Asia emerging market economies. Southeast Asia is a dynamic region in term of its economic growth and economic integration toward global economy. Emerging market economies namely Indonesia, Malaysia, Thailand and Philippines are source of economic growth in this region. This region has been hit by East Asia financial crisis in 1997 and global financial crisis in 2008. However, they were able to maintain relatively high economic growth under market-based policy. The average of economic growth in the last three
decade was not more than plus or minus 6% in the 1990s and was being slower to 5% in 2000 to 2012 (see Figure 1).

![Graph showing economic growth of Indonesia, Malaysia, Thailand, and Philippines from 1990 to 2012.]

Source: World Bank

**Figure 1. Economic Growth of Indonesia, Malaysia, Thailand and Philippines (1990–2012)**

Several factors such as integration toward global economy, high capital accumulation and export oriented policy are the rationales of this strong economic performance (Page, 1994). It can be identified by high openness index, high FDI accumulation, and high portfolio investment flow (see Figure 2). However, two financial crises in 1997 have been responded by Southeast Asian emerging market differently. Malaysia, for example, tried to escape from financial crisis in 1997 by imposing capital control and by losing its monetary independence through currency peg. Nevertheless, Thailand chose different policy by depreciating its currency and did not impose capital control (Kaplan, 2001). These situations are relatively different after East Asian financial crisis occurred. Most of Southeast Asian economies try to reduce their dependencies toward global market and increase the role of their domestic economy as occurred in Indonesia. The policy shifted from financial openness to some degree restriction of capital mobility and promotion of exchange rate stability and monetary independence.
The dynamic condition of global financial market gives impact for this region to set proper macroeconomic policies to prevent negative side of global financial fragility. Therefore, it is important to trace the effect of policies combination (e.g. exchange rate stability, monetary independence and financial openness) toward economic growth especially under financial crisis condition. Moreover, the experience of Southeast Asia countries in facing financial crisis may generate better understanding in dealing with trade-off in order to set a sound policy decision.

Based on the explanation above, this paper tries to look at the effect of exchange rate stability condition toward economic growth. We apply Aizenman, Chinn and Ito (2012) index in measuring those three policies. We choose 1980 to 2013 as or sample of periods. We also divide the effect of those three policies under East Asian financial crisis 1997 and global financial crisis 2008 by applying dummy interaction of those unique time frame and Aizenman, Chinn and Ito (2012) Index. We classified our objective into two points:

1. Explaining the effect of monetary independence, exchange rate stability, and financial openness toward
economic growth of Southeast Asia emerging market economy;

2. Explaining the effect of monetary independence, exchange rate stability, and financial toward economic growth under financial crisis condition.

2. LITERATURES

2.1. The Mundell-Fleming Model

Where the traditional IS-LM model deals with close economy, The Mundell-Fleming deals with open economy. The Mundell-Fleming model describes the relationship between the nominal exchange rate and economy output (Young and Darity Jr, 2004). This paper uses this model to render an argument that an economy cannot simultaneously maintain a fixed exchange rate, an independent monetary policy and free capital movement. In the open economy, the equation for the LM and the IS schedules are as follow.

The LM Equation

\[ M = L(y, r) \]  

(1)

The IS Equation

\[ S + T = I + G + X - Z \]  

(2)

where \((X - Z)\), net exports, is the foreign sector’s contribution to aggregate demand. For the IS equation, import is on the left-hand side. It indicates the variable upon which each element in the equation depends. Therefore, the IS equation for open economy can be written as:

\[ S_y + T + Z_{y,\pi} = I_y + G + X_{y, f, \pi} \]  

(3)

Based on equation 3, imports depend positively on income and also depend negatively on the exchange rate \((\pi)\). It signifies that a rise in the exchange rate will increase the price of foreign goods and it causes import to fall. According to Froyen (2009), balance of payment equilibrium means that the official reserve transaction balance is zero. The equation for the BP schedule can be written as:
\[ X(Y',\pi') - Z(Y,\pi) + F(r - r^f) = 0 \] (4)

The first two terms in the equation 4 constitute the net export or the trade balance. The third item, which is denoted by F, is the net capital inflow. Net capital inflow depends positively on the spread between domestic interest rate and the foreign interest rate \((r - r^f)\). It implicates that a rise in the domestic interest rate relative to the foreign interest rate leads to an increased demand for domestic financial assets at the expense of foreign assets. Hence, the net capital inflows increase (Froyen, 2009).

2.1.1 The BP Curve in the IS-LM Framework

The BP curve illustrates different combinations of income and interest rate that assure the balance of payment equilibrium (Froyen, 2009). Figure 3 exhibits that the point above the BP curve refers to the balance of payment surplus and the point below the BP curve means balance of payment deficit.

Once there is a change in income \((Y^*)\), interest rate \((r^*)\), the BP curve will shift in the ISLM framework. Figure 4 shows that a fall of \(Y^*\) together with an increase of \(r^*\) will shift the BP to the left (BP’’). For a given \(r\), the point at BP shows a deficit. However, an increase of \(Y^*\) together with a fall of \(r^*\) will shift the BP to the right (BP’). Hence, the BP shows a surplus.
The slope of BP curve depends on the international mobility level of capital. There are three situations that the slope of BP curve can be. When there is perfect capital mobility, the slope of BP curve is horizontal. When there is no capital mobility, the BP curve is vertical. Moreover, BP curve has positive slope if there is imperfect capital mobility (see Figure 5).

Figure 6 shows the equilibrium in the model with perfect capital mobility. This figure shows that the equilibrium in the model is intersection by all three curves that are IS, LM and BP curves. Based on Figure 6, it can be said that when the point is below the BP curve, the balance of payments is deficit. However, when the point is above the BP curve, the balance of payments is surplus.

2.1.2 Exchange Rate Regime: Fixed Exchange Rates versus Flexible Exchange Rates

According to Froyen (2009), the Mundell-Fleming model implies that the effectiveness of national macroeconomic policy depends on the exchange rate system. This is because in an open economy,
variable that influencing the net export and income is real exchange rate. In practice, it is very rare to see a country uses a fully flexible exchange rate regime. Mostly often, countries choose exchange rate regimes in which exchange rate is somehow controlled by monetary authorities.

In the case of Thailand, the monetary policy is under fixed exchange rates with perfect capital mobility. The policy that had been used by Thailand is no monetary policy autonomy. Consequently, Thailand sacrificed its autonomy in monetary policy in order to have fixed exchange rate and capital mobility.

![Figure 7. The Case of Thailand](image7.png)

![Figure 8. The Case of Malaysia](image8.png)

Figure 7 reveals that expansionary monetary policy will shift the LM$_0$ to the right (LM$_1$) that leads to an increase of income (Y) and a fall of interest rate (r). As a result, a fall in interest rate will cause a decrease in capital inflow and a balance of payments becomes deficit. In order to keep the exchange rate fixed, central bank sells foreign currencies and cuts money supply. By selling foreign money and receiving back the domestic money, it would reduce real balances in the economy. As a result, the LM curve shifts back to LM$_0$. Accordingly, income falls and interest rate increases to the previous level. In conclusion, the income and interest rate will be constant and monetary policy is ineffective.

In the case of Malaysia, the monetary policy is under fixed exchange rates with imperfect capital mobility. The policy had been used by Malaysia is capital control. Therefore, Malaysia has sacrificed the goal of capital mobility in order to attain its fixed exchange rate and monetary policy autonomy. Figure 8 depicts that expansionary monetary policy will shift the LM$_0$ to the right (LM$_1$) which leads to an increase of income and a fall of interest rate.
rate. As a result of a fall in interest rate there will be a decrease in capital inflow and a balance of payments deficit. The equilibrium point shifts from E0 to E1. The rate of interest falls and the level of income rise. The new equilibrium point is below the BP schedule, indicating a deficit in the balance of payment.

2.2 Literature Review on Trilemma

A country with an open economy would basically face a macroeconomic trilemma. It consists of three desirable but contradict macroeconomic goals, namely; to stabilize exchange rate, to enjoy free international capital mobility, and to engage in a monetary policy oriented toward domestic goals (Obstfeld, Shambaugh and Taylor, 2004). The nature of the trade-off between those three macroeconomic goals is that should a country decides to have a higher degree of one or two out of the three variables (Aizenman, Chinn and Ito, 2008).

A study conducted by Aizenman, Chinn and Ito (2008) attempted to see how trilemma mechanisms have an impact on output volatility in developing countries. It is found that a country which has high level of monetary independence and greater exchange rate stability would reduce output volatility. The greater exchange rate stability would be able to reduce output volatility through accumulation of reserves. Such situation can be observed in the case of Malaysia in 1998 after capital control was being imposed by the authority. Capital control imposed by Malaysian authority in 1998 has an objective to control capital outflow as well as eliminating the offshore Ringgit trading activities. According to Kawai and Takagi (2003, p.9), “Portfolio investors were restricted from repatriating funds invested in Malaysia for at least one year, and the offshore trading of ringgit was prohibited”.

Malaysian’s capital control created divided opinions. It is regarded as non-necessary as the other crisis-hit country which went for free capital flow has recovered at almost the same time with Malaysia (Kawai and Takagi, 2003). However, Kaplan and Rodrik (2001) claimed that such a simple comparison between Malaysia and its ASEAN counterpart like Korea and Thailand in the time of recovery is quite misleading. The opponents of
Malaysian capital control fail to see in making comparison is the different situations among the respective countries when the recovery take place. During the recovery process in 1998, Korea and Thailand have more stable exchange rates regime, low inflation, low interest rate and a high level of FDI. On the other hand, Malaysia’s economic condition was hardly stable. Malaysia experienced a very volatile exchange rate and a severe speculative attack on Ringgit. The Ringgit has declined for the most part of 1998 and the offshore ringgit interest rate remained high.

Figure 9. Malaysia Trilemma Indexes

During 1997/1998, where the Asian Financial Crisis triggered in the East Asian region, Malaysian authority went for a lower level of free capital flow, which impose a control on capital outflow and also adopt for more stable exchange rate regime; where the authority pegged the ringgit at RM3.80 per USD and also a higher level of monetary independence. Nevertheless, the situation is completely different during the year of 2007/2008. The financial crisis triggered during that time has resulted in higher level of financial openness and exchange rates stability. The level of monetary independence has been lowered during that time (see Figure 9).

During Asian Financial Crisis in 1997, Malaysia has experienced trade deficit. Thus, it indicates a lower level of accumulated international reserves. Such lower level of international reserve has made it difficult for the authority to
maintain stability in exchange rates regime. Therefore, in order to ensure stability in exchange rates regime, they need to have higher level of monetary independence and some degree of control has been imposed on the capital outflow; to prevent huge speculative attacks against the ringgit which would result in a highly volatile exchange rates.

On the other hand, during the 2008 Global Financial Crisis, Malaysia has experienced trade surplus, which is associated with a high level of financial openness in the country, it would enable them to accumulate adequate international reserves to stabilize their exchange rates. Due to having both exchange rates stability and financial openness, the authority will not go for higher level of monetary independence. In conclusion, it can be observed that the main objective that Malaysian authority wants to achieve is by having a high level of exchange rates stability. It can be done by either forgoing or lowering the level of either monetary independence or financial openness.

3. METHODOLOGY

3.1 Model and Data Source

This paper also modified the model of Aizenman and Sengupta (2012) and added financial crisis interaction to identify the effectiveness of those three policy in dealing with financial shock. The model used in this paper is as follows:

\[ Y_{it} = \beta_0 + \beta_1 M_{it} + \beta_2 ES_{it} + \beta_3 KO_{it} + \beta_4 OPN_{it} + \beta_5 INF_{it} + \beta_6 FCR_{it} \varepsilon_{it} \]

In the second model, this paper uses moderated dummy financial crisis with first model to investigate the effect of financial crisis on three different polices toward economic growth of selected Southeast Asian countries.

\[ Y'_{it} = \beta_0 + \beta_1 M_{it} + \beta_2 ES_{it} + \beta_3 KO_{it} + \beta_4 Crisis_{97} \times TLM_{it} + \beta_5 Crisis_{08} \times TLM_{it} + \beta_6 OPN_{it} + \beta_7 INF_{it} + \beta_8 FCR_{it} \varepsilon_{it} \]

The definition of each variable is depicted in table 1 below:
Table 1. Variable Definition and Source of the Data

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>Definition</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Y</td>
<td>Economic Growth</td>
<td>Portland State University</td>
</tr>
<tr>
<td>2</td>
<td>MI</td>
<td>Monetary Independence Index</td>
<td>Portland State University</td>
</tr>
<tr>
<td>3</td>
<td>ES</td>
<td>Exchange Rate Stability</td>
<td>Portland State University</td>
</tr>
<tr>
<td>4</td>
<td>KO</td>
<td>Capital Account Openness Index</td>
<td>World Bank</td>
</tr>
<tr>
<td>5</td>
<td>Crisis97*TLM</td>
<td>Interaction between Dummy for Crisis 1997 and Trilemma Index</td>
<td>World Bank</td>
</tr>
<tr>
<td>6</td>
<td>Crisis08*TLM</td>
<td>Interaction between Dummy for Crisis 2008 and Trilemma Index</td>
<td>World Bank</td>
</tr>
<tr>
<td>7</td>
<td>OPN</td>
<td>Openness Index</td>
<td>World Bank</td>
</tr>
<tr>
<td>8</td>
<td>INF</td>
<td>Inflation</td>
<td>World Bank</td>
</tr>
<tr>
<td>9</td>
<td>FRC</td>
<td>Foreign Currency Reserve/GDP</td>
<td>World Bank</td>
</tr>
</tbody>
</table>

Indonesia, Malaysia, Philippines and Thailand are the samples which represent South East Asia countries. Moreover, this paper employs annual data from 1980-2013. To measure monetary independence index, the annual correlation of monthly Aizenman, Chinn and Ito (2008) or quarterly Aizenman and Sengupta (2012) interest rate between the home and base country is being used. Aizenman, Chinn and Ito (2008) used money market rates.

\[ MI = 1 - \frac{\text{corr}(i, j)}{1 - (1)} \quad (5) \]

The index shows the correlation between the interest rates in home and the base country; where \( i \) represents home country while \( j \) represents the base country (see Equation 5). The index would be ranged from 0 to 1. The higher the index, the higher will be the degree of monetary independence.
For exchange rate stability, the standard deviation of monthly Aizenman, Chinn and Ito (2008) or quarterly Aizenman and Sengupta (2012) exchange rate between home and base country was used, as depicted in the Equation 6. In this paper, we used Aizenman, Chinn and Ito (2008) method by using the monthly exchange rates data. The higher the value of ERS indicates a more stable exchange rate will be recorded against base country’s currency. Moreover, for the measurement of capital control in a country, we use the capital account openness index, KAOPEN, which has been proposed by Chinn and Ito (2008).

\[
ERS = \frac{0.01}{0.01 + \text{std}(\Delta \log(\text{exchrate}))}
\]  

(6)

3.2 Method of Estimation

This paper uses panel data as method of estimation. A panel data, or longitudinal data, is one that follows a given sample of individuals over time, and thus provides multiple observations on each individual in the sample (Hsiao, 2003). In dealing with balance panel data, Pyndick and Rubenfield (1998) classified the method to estimate data panel analysis into three categories namely, Pooled Least Square, Fixed Effect and Random Effect.

Pooled Least Square

The simplest technique of panel data is through pooled least square. The equation for pooled least square is as follows:

\[
Y_{it} = \alpha + \beta X_{it} + \epsilon_{it}
\]

where \(i = 1, 2, 3, \ldots, N\) and \(t = 1, 2, 3, \ldots, T\)

This model is implicitly assuming that the coefficients (including the intercepts) are the same for all individuals. Suppose each individual (\(i\)) has time-invariant but unique effects on the dependent variable. Since the pooled regression neglects the heterogeneity across individuals and assumes the same coefficients for all individuals, those effects unique to each individual are subsumed in the error term. Thus, the explanatory variables will no longer be uncorrelated with the error term and generates biased and inconsistent estimation (Kim, 2012).
Fixed Effect

According to Gujarati (2003), the term “fixed effect” is due to the fact that although the intercept may differ across individuals, each entity’s intercept does not vary over time (i.e., time-invariant). Dummy variable is used to allow the difference in parameter values between individual in cross section. This method is widely known as fixed effect or Least Square Dummy Variable (LSDV). The equation for this method is as follows:

\[ Y_{it} = a + bX_{it} + g_2W_{2t} + g_3W_{3t} + \cdots + g_nW_{nt} + d_2Z_{i2} + \cdots + d_tZ_{it} + e_{it} \]

where:

\[ W_{it} = \begin{cases} 
1 & \text{is for } i^{th} \text{individual, } i = 2, \ldots, N \\
0 & \text{is for otherwise} 
\end{cases} \]

\[ Z_{it} = \begin{cases} 
1 & \text{is for } t^{th} \text{time, } i = 2, \ldots, T \\
0 & \text{is for otherwise} 
\end{cases} \]

The decision for the inclusion of dummy variable is must be based on the statistical reference. The additional dummy variables will decrease the degree of freedom which will affect the estimation result.

Random Effect

An alternative to the fixed effect model is random effect model. This method proposes different intercept terms for each individual and these intercepts are constant over time. The different parameters between individual and time are combined into the error component. That is why this method is usually called as Error Component Model (ECM). The equation for random effect mode is as follows:

\[ Y_{it} = a + \beta X_{it} + \epsilon_{it} \]

\[ \epsilon_{it} = u_i + v_t + w_{it} \]

where: \( u_i \sim N(0, \delta_u^2) \) = cross section error component; \( v_t \sim N(0, \delta_v^2) \) = period error component; and \( w_{it} \sim N(0, \delta_w^2) \) = combination error component.

The random effect method does not decrease the degree of freedom. Therefore, the estimation is more efficient and more likely be unbiased. Finally, the decision of the chosen method will
be based on the *Chow Test*, Hausman Test and *The Breusch-Pagan LM Test*.

**Chow Test**

Chow test is used to choose the method between pooled least square and fixed effect which can give the best estimation result to the model. The hypothesis for this test is $H_0$: Pooled Least Squared; while $H_1$: Fixed Effect.

The value of the F-statistic as the basis to reject or do not reject $H_0$ is as follows:

$$F_{N-1,NT-N-k} = \frac{(RRSS - URSS)/(N - 1)}{(URSS)/(NT - N - k)}$$

Where $RRSS$ is restricted residual sum squared, $URSS$ in unrestricted residual sum squared, $N$ is the total of cross section data, $T$ is the total of time series data and $k$ is total of the explanatory variables. If the value of prob $F < \alpha$, then $H_0$ is rejected and use fixed effect. If prob $F > \alpha$, then $H_0$ is not rejected and use pooled least squared.

**Hausman Test**

Hausman test is used to choose the best method between fixed effect and random effect. The hypothesis for this test $H_0$: Random Effect; while $H_1$: Fixed Effect. If the value of prob $F < \alpha$, then $H_0$ is rejected and use random effect. If prob $F > \alpha$, then $H_0$ is not rejected and use fixed effect.

**The Breusch-Pagan LM Test**

The Breusch-Pagan LM test is applied to choose between random effect and pooled least square which gives the best estimation result. The hypothesis for this test is $H_0$: Pooled Least Square; otherwise $H_1$: Random Effect. If the value of prob $F < \alpha$, then $H_0$ is rejected and use random effect. If prob $F > \alpha$, then $H_0$ is not rejected and use pooled least square.
4. RESULT AND DISCUSSION

Before we get the best model to apply regression analysis to our data, we apply several steps to find the best panel analysis model. Firstly, we begin with chow test to compare which one of the model, OLS or fixed effect, giving us the best result. F-probability statistic shows 0.00 percent means that we have to choose fixed effect rather than OLS model.

Secondly, we apply LM test to determine the best model between OLS and random effect. The probability Chi-squared shows values 0.00. It means we have to reject null-Hypothesis and conclude that random effect is better model. Thirdly, we choose Hausman test to find the best model between random effect and fixed effect. The Hausman probability chi-square shows 0.00 percent lower than 0.05 percent. It means we have to reject null-hypothesis and choose fixed effect as our best model. Table 5.1 shows us the estimation result from random effect and fixed effect. Based on Hausman test the fixed effect give us the best result to be interpreted.

The estimation result indicates that the monetary independence and financial openness are negatively significant in determining economic growth in the entire sample periods. The monetary independence is significant at alpha 10 percent with coefficient -0.25 and financial openness is significant at alpha 1 percent with coefficient –0.70. These estimation results show us that monetary independence and financial openness is not desirable target for economic growth. One of possible explanation why monetary independence negatively correlated with the economic growth in these region was that it could trigger currency fluctuation in small and open economy which need exchange rate stability. Moreover, the negative sign of financial openness exhibits that capital control for some degree positively afflict economic growth.

This result is in line with Kaplan and Rodrik (2001) who confirmed the positive effect of capital control in reducing volatility in financial market that lead to sound economic condition. Substantial capital inflow or outflow in emerging
market will trigger higher exchange rate volatility and increase the uncertainty for business environment. By imposing some degree of capital control, monetary authority could help reducing the volatility. The evidence of Malaysian experience exhibited that some degree of capital control could affect positively the economic growth.

Table 2. Estimation Result

<table>
<thead>
<tr>
<th>Dependent Variable: Economic Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Estimation Model</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Coefficient</th>
<th>Coefficient</th>
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<tbody>
<tr>
<td><strong>Mixed</strong></td>
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<td>-0.25*</td>
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<tr>
<td>(0.28)</td>
<td>(0.10)</td>
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<tr>
<td><strong>ES</strong></td>
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<td>0.05</td>
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<td>(0.14)</td>
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<td><strong>KO</strong></td>
<td>0.56**</td>
<td>-0.70***</td>
</tr>
<tr>
<td>(0.24)</td>
<td>(0.00)</td>
<td></td>
</tr>
<tr>
<td><strong>Openness</strong></td>
<td>-0.00***</td>
<td>0.002</td>
</tr>
<tr>
<td>(0001)</td>
<td>(0.00)</td>
<td></td>
</tr>
<tr>
<td><strong>Inflation</strong></td>
<td>0.53***</td>
<td>0.30</td>
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<tr>
<td>(0.14)</td>
<td>(0.13)</td>
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<tr>
<td><strong>FCR</strong></td>
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<td>0.21</td>
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<tr>
<td>(0.12)</td>
<td>(0.11)</td>
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<table>
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<th>Variable Interactions with Crisis</th>
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<tr>
<td><strong>MI*Crisis 97/98</strong></td>
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<tr>
<td>(9.41)</td>
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<tr>
<td><strong>ES*Crisis 97/98</strong></td>
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<tr>
<td>(1.16)</td>
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<tr>
<td><strong>KO*Crisis 97/98</strong></td>
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<tr>
<td>(5.68)</td>
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<tr>
<td><strong>MI*Crisis 07/08</strong></td>
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<td>(1.54)</td>
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<tr>
<td><strong>ES*Crisis 07/08</strong></td>
</tr>
<tr>
<td>(1.16)</td>
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<tr>
<td><strong>KO*Crisis 07/08</strong></td>
</tr>
<tr>
<td>(0.98)</td>
</tr>
</tbody>
</table>

| R-square | Overall: 0.37 | Between: 0.54 |

Subscript *, **, *** indicates for level of significances in 10%, 5%, and 1 %. 
Moreover, the exchange rate stability is not significant. The positive coefficient of this variable indicates that exchange rate stability policy might be desirable for attaining higher economic growth in Southeast Asia emerging market. The problem of currency instability that lead East Asian financial crisis was a good example of how currency stability is the necessary condition for open economy. Moreover, control variables (e.g. inflation and openness index) show insignificancies on economic growth in this model.

With regard to the crisis, Southeast Asia emerging market countries were afflicted by two financial crises. First is the Asian financial crisis in 1997/1998 and second was the global financial crisis in 2008/2009. The estimation result of variable interaction with crisis shows that during 1997 Asian financial crisis, monetary independence, exchange rate stability and financial openness are not statistically significant. However, the negative coefficient for monetary independence and financial openness variables exhibits that during that crisis, both monetary independence and financial openness policies worsen the economic growth. Hence, the exchange rate stability policy was desirable during the 1997 Asian financial crisis. The exchange rate stability was needed at that time to reduce uncertainty on real business activity and inflation.

Furthermore, the global financial crisis in 2008 provided different conclusion with the 1997 Asian financial crisis. During the global financial crisis period, financial openness and exchange rate stability were positively affected economic growth of those countries, while the monetary independence index was negatively affected economic growth. The exchange rate stability is significant at alpha 5 percent with coefficient 0.89 and the financial openness is significant at alpha 1 percent with coefficient 0.78. The monetary independence is significant at alpha 1 percent with coefficient -1.05. These estimation results indicate that exchange rate stability is desirable policy to reduce the negative effect of global financial crisis for economic growth of those countries. This result shows the advantage of promoting macroeconomic combination policy between exchange rate stability and financial openness by losing monetary independence.
Hence, it can be inferred that keeping exchange rate stable during global financial crisis promote conducive environment for real sector to keep growing. The need of monetary independence to stimulate the economy by reducing benchmark rate at that time would not be effective to stimulate the economy if it could trigger exchange rate fluctuation.

![Malaysia Balance of Trade](source: tradingeconomics.com)

**Figure 11. Malaysia Balance of Trade**

![Indonesia Balance of Trade](source: tradingeconomics.com)

**Figure 12. Indonesia Balance of Trade**

In addition, if we look at Capital Account Openness Index, the coefficient of dummy interaction was different between East Asian financial crisis and global financial crisis. This can be
explained by analyzing the balance of payment of Southeast Asia emerging market. Before East Asian financial crisis Indonesia, Malaysia, Thailand, and Philippines suffer with trade deficit (see Figure 11 and Figure 12). The financial openness during crisis only leads toward instability in currency exchange. On the other hand, those countries had been experiencing trade surplus after East Asian financial crisis and financial openness was not affected the capacity of those countries to maintain exchange rate stability.

5. CONCLUSION

Trilemma is a condition in which a country cannot attain all the target of exchange rate stability, monetary independence and financial openness. There are at least one or two targets which are achievable. The experience of Southeast Asia emerging market economy shows the capability of those countries to tackle the effect of 1997 Asian financial crisis and global financial crisis in 2008. By using balanced panel data approach with data ranging from 1980-2013, this study attempts to investigate the effect of monetary independence, capital control and exchange rate stability toward economic growth in Indonesia, Malaysia, Thailand and Philippines as the Southeast Asia representative. According the estimation result, there are some salient findings that need to be highlighted:

1. The financial openness significantly affects the economic growth of Southeast Asian emerging market with negative coefficient. This negative coefficient indicates that capital control, for some degree, positively affects the economic growth of those countries. The role of capital control in this sense is to reduce the volatility in the financial market and lead to stabilization of economic condition.

2. During, the 1997 Asian financial crisis, there are none of the variables which is significant toward economic growth. However, the negative coefficient for monetary independence and financial openness shows that both policies will worsen the economic growth.
During global financial crisis in 2008, financial openness and exchange rate stability policies positively affect the economic growth, while the monetary independence policy negatively affects the economic growth of Southeast Asian emerging market. This result indicates the advantage of promoting the macroeconomic combination between exchange rate stability and financial openness by losing the monetary independence.

REFERENCES


Current Account and Financial Stability
Driving Factors of Current Account Movement and Indonesian Financial Stability

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Abstract
The imbalance in the current account has been debated for a long time. Deficits in the long term into often raises concern because of the economic crisis is often preceded by a prolonged of current account deficits. But keep in mind if the current account deficit is not always caused by the inability of the economy to compete in the global market which makes the value of imports greater than exports. The current account deficit on the other side is a reflection of the saving - domestic investment position in the economy. If the deficit is caused by the position of investment larger than savings, then this is a good indication for an economy. The study in this paper shows if the Indonesian current account movement can be divided into two episodes, which is a reflection of saving - investment in the period before crisis in 1997, and a reflection of export - import in the period after the crisis. Hence it is important to see further how Indonesian current account ability
to overcome the existing shocks. Analysis used SVAR method indicates that the exchange rate is a variable that gives the greatest influence on the movement of Indonesian current account. The ability of the current account Indonesia in overcoming the shocks is quite weak, because of its ability to return to equilibrium pattern are relatively takes long time.

Keywords: saving-investment approach, current account adjustment, open economy, demographic effect

JEL Classification: E22, F32, F41, J11

1. INTRODUCTION

Financial stability is difficult to define and even more difficult to measure. Strictly speaking, a financial system can be characterized as stable in the absence of excessive volatility, stress or crises. Policymakers and academic researchers have focused on a number of quantitative measures in order to assess financial stability. Basically, the measurement is focused on six sectors, one of which can be accessed through the external sector reflected on the exchange rate, foreign exchange reserves, current account and capital flows (Gadanecz & Jayaram, 2008).

The imbalance in the current account balance has been controversial in the analysis of international trade policy. Debates which reflect back the David Hume theory with emphasis on the current account balance as a potential tool in the international transmission shocks or as financial vulnerability. Some evidence indicates if a crisis is often preceded by the current account deficit in large numbers, including in some developed countries (Obstfeld M., 2012).

Current account balance generally shows the difference between exports and imports of goods (including services). Intertemporal approach to the current account analysis widened in the approach through private saving and investment decisions as well as the government's decision as a result of forward based calculation on expectations of future productivity growth, demand for government spending, the real interest rate, and many more.
Current account imbalances can be caused by a mismatch between savings and investment. When the savings position lower than expected investment, the foreign party will balance both. Period magnitude of capital inflows are generally accompanied by increased investment. The IMF itself has highlighted the need to look at the movement of domestic savings and investment in analyzing the current account phenomenon.

The question then arises whether the current account deficit is a good or bad indication for an economy? If the deficit reflects an excess of imports over exports, it may be indicative of competitiveness problems, but because the current account deficit also implies an excess of investment over savings, it could equally be pointing to a highly productive, growing economy. If the deficit reflects low savings rather than high investment, it could be caused by reckless fiscal policy or a consumption binge. Or it could reflect perfectly sensible intertemporal trade, perhaps because of a temporary shock or shifting demographics. Without knowing which of these is at play, it makes little sense to talk of a deficit being “good” or “bad.” Deficits reflect underlying economic trends, which may be desirable or undesirable for a country at a particular point in time (Ghosh & Ramakrishnan, 2012).

Studies in five ASEAN countries, namely Malaysia, Indonesia, Thailand, Philippines, and Singapore indicate if the trade in manufactured goods trend in these countries, especially Indonesia and Malaysia, provide surplus figures, but the current account deficit remained during the period of the 1990s (Moreno, 2007). Export growth looks larger and more stable over the period of the current account deficit compared to those experienced after 1996. of the Condition reversal of deficit to the surplus current account is said does not reflects the strong export boost because the opposite things happened. Exports value in 1998 in almost all samples becomes contracted. It suggested should be further studies on the different dimensions of the current account to explain it.
The position of Indonesia's current account itself persistently deficit from early 1980s until then experienced a sharp reversal in 1997. The current account surplus lasted until 2011, before returning deficit. This study examines several variables effects which are considered to encourage the Indonesian current account movement. The equation systems in the model are estimated by the Structural Vector Autoregressive (SVAR) approach. This approach is interesting because it can still be based on economic theories that exist on long-term relationships in a model system, while the short-term dynamics can also be estimated as within the VAR framework.

Structural Vector Autoregressive (SVAR) models are frequently used to detect a relationship across macroeconomic fundamentals because these models enable an analysis of how current account responds to macroeconomic fundamentals shocks. The use of the SVAR approach encounters some restrictions imposed by economic theory in defining these shocks. Tiwari et al (2015) attempt to test the relationship between budget deficit and current account balance in Greece, from 1976 to 2009 using a structural autoregressive (SVAR) model. They find that in case of Greece there is no long run relationship between budget deficit and current account deficit either in the presence or in absence of structural breaks in the data set. Further, impulse response functions (IRFs) calculated shows that increase in budget deficit increases the current account deficit, which is consistent with the twin deficit hypothesis.

Lee and Chinn (1998) using SVAR to analysis the current account and the real exchange rate for seven major industrialized countries (the US, Canada, the UK, Japan, Germany, France, and Italy). They find temporary shock which is associated with a monetary innovation play a bigger role in explaining the variation in the current account, except for the US. A permanent shock which interprets as a technology innovation induces a permanent appreciation of the real exchange rate. Except for UK, the temporary shock depreciates the real exchange rate and improves the current account balance.
Both previous research showed the movement of the current account is affected by shocks originating from fiscal and monetary policy, but they do not show how the mechanism of the shocks affecting the current account over savings or domestic investment explicitly. Aquino and Espino (2013) examined the Harberger-Laursen-Metzler (HLM) effect in Peru. The HLM effect is the deterioration in the savings level of an economy due to a decline in their terms of trade for a given level of investment. This deterioration is caused by lower revenues which worsen the current account. The results show that shocks to the terms of trade and price of exports improve the current account through an increase on the saving rate, but such effect vanishes as investment increase faster than saving does. A similar shock to the price of imports negatively affects the current account through the deterioration of saving.

This study analyzes several factors that theoretically and empirically said to affect the Indonesian current account. As mentioned earlier, surplus or deficit in the current account can not mean good or bad without seeing what factors are behind the movement. Therefore, the variables used here consider their effects on international trade transactions and domestic saving-investment movement. It is intended to provide a clearer picture of the driving variable of the current account movement and the strength of Indonesian current account handles various shocks, especially external shocks.

The analysis shows if Indonesian current account is very responsive to the various shocks that were tested in this study. Exchange rate is a variable that had the highest impact and persistently encourages the movement of Indonesian current account. The result also shows if the Indonesian current account tend to be more elastic as a result of an external shock that occurs in real sector (output gap) than external shock that occurred in monetary sector (real interest rate gap). But it must be underlined, if the ability of Indonesian current account is relatively less powerful in the face of existing shock because its pattern is need relatively long time to the early equilibrium value. The paper is organized as follows. The first part is an introduction. The second
part shows the literature review. The third part contains data and methodology used. Section four contains the result and analysis, and conclusions on the fifth.

2. LITERATURES

2.1 Key Financial Stability Definition: A Brief Review
In recent years, financial stability issues have been receiving priority attention from policy makers around the world. One main catalyst for this trend was the East Asian financial crisis of the late 1990s. Following that turmoil, the World Bank and the International Monetary Fund (IMF) introduced the Financial Sector Assessment Program (FSAP) in 1999, aimed at assessing regularly the strengths and weaknesses of financial systems in their member countries (Alawode & Al Sadek, 2008). Despite this increased focus on financial stability issues, it is notable that a widely accepted definition of “financial stability” does not exist and the concept has generated a fair amount of debate among academics, market participants and policy makers. This difficulty is often explained by the relative infancy of the field of financial stability, compared to the analysis of price or monetary stability which has a much longer history.

Two schools of thought are clearly discernible in the literature: first, writers who prefer to define financial instability. Davis (2003) define financial instability or disorder as entailing heightened risk of a financial crisis as a major collapse of the financial system, entailing inability to provide payments services or to allocate credit to productive investment opportunities. Davis stressed that the crisis will in turn have a major impact on the overall economy. Mishkin (1999) states that financial instability occurs when shocks to the financial system interfere with information flow so that the financial system can no longer do its job of channeling funds to those with productive investment opportunities. Both stressed that financial instability occurs when there is an inability to perform duties of the financial system in allocating funds on productive investment opportunities. Second, writers who attempt to define financial stability.
Petrovska and Mihajlovksa (2013) using the definition of the National Bank of the Republic of Macedonia which defines financial stability as the requirement for smooth operation of all segments of the financial system, with each of them providing the highest possible level of flexibility to absorb potential shocks. Simpler definition used by Gadanecz and Jayaram (2008) yang menyatakan a financial system can be characterized as stable in the absence of excessive volatility, stress or crises. But they also underline if this narrow definition is relatively simple to formulate, but fails to capture the positive contribution of a well-functioning financial system to overall economic performance. They also mention broader definitions of financial stability encompass the smooth functioning of a complex nexus of relationships among financial markets, infrastructures and institutions operating within the given legal, fiscal and accounting frameworks. Fundamental similarities between the two indicate if the financial stability or flexibility characterized by the ability of the financial system to absorb various shocks, volatility, or crisis.

Stakeholders have focused on a number of quantitative measures in order to assess financial stability. Gadanecz and Jayaram (2008) summarizes the measures commonly used in the literature, their frequency, what they measure, as well as their signaling properties.

1) the real sector is described by GDP growth, the fiscal position of the government and inflation. GDP growth reflects the ability of the economy to create wealth and its risk of overheating. The fiscal position of the government mirrors its ability to find financing for its expenses above its revenue (and the associated vulnerability of the country to the unavailability of financing). Inflation may indicate structural problems in the economy, and public dissatisfaction with it may in turn lead to political instability.

2) the corporate sector’s riskiness can be assessed by its leverage and expense ratios, its net foreign exchange exposure to equity and the number of applications for protection against creditors.

3) the household sector’s health can be gauged through its net assets (assets minus liabilities) and net disposable income (earnings
minus consumption minus debt service and principal payments). Net assets and net disposable earnings can measure households’ ability to weather (unexpected) downturns.

4) The conditions in the external sector are reflected by real exchange rates, foreign exchange reserves, the current account, capital flows and maturity/currency mismatches. These variables can be reflective of sudden changes in the direction of capital inflows, of loss of export competitiveness, and of the sustainability of the foreign financing of domestic debt.

5) the financial sector is characterized by monetary aggregates, real interest rates, risk measures for the banking sector, banks’ capital and liquidity ratios, the quality of their loan book, standalone credit ratings and the concentration/systemic focus of their lending activities. All these proxies can be reflective of problems in the banking or financial sector and, if a crisis occurs, they can gauge the cost of such a crisis to the real economy.

6) variables that are relevant to describe conditions on financial markets are equity indices, corporate spreads, liquidity premia and volatility. High levels of risk spreads can indicate a loss of investors’ risk appetite and possibly financing problems for the rest of the economy. Liquidity disruptions may be a materialization of the market’s ability to efficiently allocate surplus funds to investment opportunities within the economy.

Typically financial stability analysis would use several sectoral variables either individually or in combinations. The use of such measures including the financial soundness indicators as key indicators of financial stability depends on the benchmarks and thresholds which would characterize their behavior in normal times and during periods of stress. In the absence of benchmarks, the analysis of these measures would depend on identifying changes in trend, major disturbances and other outliers (Worrell, 2004)
2.2 Current Account and International Capital Flows Position

Theoretically, the current account not only exports minus imports but also net capital gains on existing foreign assets (Obstfeld & Rogoff, 1995). The current account also shows the position of national saving minus domestic investment. If savings is lower than expected investment, foreigners will balance both.

Balance of payments and data associated with international investment position conceptually have very close relationship with recording system of national account balance. National account balance provides a framework that is more comprehensive and systematic in collection and presentation of economic statistics (International Monetary Fund, 1993). The relationship between aggregate economic accounts and balance of payments flows can be summarized in terms of saving-investment (International Monetary Fund, 2009).

\[ GDP = C + I + G + X - M \]  
(1)

where: \( C \) is private consumption expenditure; \( G = \) government consumption expenditure; \( I = \) gross domestic investment; \( S = \) gross saving; \( X = \) exports of goods and services; and \( M = \) imports of goods and services.

Gross national disposable income (GNDY) definition is GDP added by net income from abroad:

\[ GNDY = C + I + G + X - M + BPI + BSI \]  
(2)

where: \( BPI \) is balance on primary income and \( BSI \) is balance on secondary income (net current transfers).

Current account becomes:

\[ CAB = X - M + BPI + BSI \]  
(3)

Current account balance can be seen in proportion to the difference between disposable income and expenditure.

\[ CAB = GNDY - C - G - I \]  
(4)

or

\[ GNDY = C + G + I + CAB \]  
(5)
Definition used in the *System of National Accounts* (SNA) on revenue account:

\[ S = GNDY - C - G \]  

Substitution of equation (5) in equation (6):

\[ S = I + CAB \]  

or:

\[ CAB = S - I \]  

It can be seen if the current account balance is the difference between saving and investment, so that the current account balance is a reflection of the behavior of saving and investment in the economy.

Analysis of current account balance change in an economy is important to pay attention to changes that reflect the savings and investment movement. For example, an increase in investment relative to savings would be the same effect on the current account as well as a decrease in savings relative to investment, at least in the short term. Long-term implications for the external economy could be slightly different. Identity above generally indicates if any change in the current account of an economy (e.g., enlargement of the surplus or deficit shrinks) is essentially proportional to the increase in savings relative to investment. This relationship demonstrates the importance of the implementation of policies that can be designed to change the current account directly (for example, changes in tariffs, quotas, and exchange rates) that affect the saving and investment behavior.

The relationship between domestic transactions and international identity shown in equation (2.4). The implications of this relationship to the analysis of the balance of payments is an increase in the current account of a country requires a reduction in spending relative to income. Alternatively, it is possible to improve the position of the current account balance by increasing the national income which is not in accordance with the increase in consumption or an increase in domestic investment.
Implementation of structural measurements of increased economic efficiency could be one way to achieve that goal.

The other important point is shown on the above identity that are more indicative of the relationship between variables definition compared than the of economic agents behavior explanation. Identity above alone cannot provide a complete analysis of the factors that determine the current account development. For example, total expenditure on goods and services by domestic residents \((C + G + I)\) seem affected by the part of their income \((GNDY)\). Therefore the analysis of GNDY changes effects to current account balance is not enough only use equation (2.4) identity without considering the inclusion of consumption and capital formation responses in these changes. The illustration shows the importance of understanding the population expenditure part in an economy when analyzing the balance of payments.

International capital flows can be divided into two types (Ju & Wei, 2006), namely: 1) the flow of financial capital are decided by the investor, and 2) foreign direct investment which is determined by the employer. The flow of financial capital occurs when investors invest their resources into the international financial markets or directly into an activity carried out by foreign businessmen. Foreign direct investment on the other hand occurs when employers engage in activities outside the country and produce there. Investors will invest in countries with higher interest rates, while entrepreneurs will put their activities in countries with lower production costs.

Capital flows will be determined by: \(\hat{r} = \frac{(r^* - r)}{r} \), where \(r^*\) is the yield of capital abroad and \(r\) is the yield on domestic capital. If \(\hat{r} > 0\), financial capital moves from domestic to overseas. A country that is relatively rich in labor has an interest rate \((r)\) higher if it domestic financial sector is more developed or have a smaller risk.

Lucas using one sector model expressed the paradox when a lot of capital does not move from rich countries to poor countries (Ju & Wei, 2006). Because of free trade, the prices of
goods will be balanced in all countries. The law of diminishing returns resulting higher \( r \) in countries with smaller capital per capita. The difference yields value to be a reason the flow of capital from rich countries to poor countries. The conditions did not happen so called Lucas paradox.

The standard model Heckscher-Ohlin-Samuelson known as the model of 2x2x2 (two goods, two factors of production, and two countries), indicates if any company would earn zero profit:

\[
p_1 = c_1 (w; r) \text{ dan } p_2 = c_2 (w; r) \quad (9)
\]

where \( c(\cdot) \) is a cost per unit function. On given particular product prices, the value of \( w \) and \( r \) are determined by \( L \) and \( K \) factors resources owned by the country. Improved \( K \) alter the composition of the product. Capital-intensive goods produced more and the opposite occurs for labor-intensive goods. Marginal yield on physical capital in each sector have not changed. Free trade will balance products prices and thus balancing factors return in each country even though there are no international factor movements. Capital flows is fully substituted by trading in goods.

The capital flows into developing countries are caused by several factors (Indawan et al., 2013). The high degree of financial integration in line with the rapid development of technology, especially information and communication technologies play a major role in accelerating the increased of capital flows mobility. Capital market infrastructure development, along with capital market liberalization such as the elimination of barriers to the repatriation, reduction of participation barriers, and foreign ownership also contribute to the expansion of capital flows to emerging markets.

Theoretically, the relationship between trade and capital liberalization is not straightforward. Economic integration on the one hand increases the demand and new investment opportunities as well as the importance of reallocating capital makes domestic financial development become more relevant. On the other hand, the integration allows some of the tradable sector gain greater
accesses to international capital markets which make the local financial system become less relevant (Braun & Raddatz, 2007).

The current account deficit is the result of consumption and savings decision in an open economy with the capital flow possibility (Calvo et al., 1996). The model developed from Irving Fisher model derivation indicates that changes in interest rates pushed the income effect and the substitution effect. For a debtor country, decrease in interest rates led to the expansion of consumption and increasingly current account deficit. Declines in interest rates mean lower net debt present value which gives a positive income effect. Meanwhile the substitution effect occurs because the debt becomes cheaper so that consumption increased. In an open economy model, the increase in capital flows tend to be accompanied by increased of consumption and investment, which in turn increase the current account deficit.

Empirical studies conducted by Bosworth and Collins (1999) found that a large portion of capital flows to developing countries are used to finance current account deficit, which means the transfer of capital flows directly intended for investment, rather than consumption. The results of their study showed that there are significant differences between various types of capital flows on investment. Foreign direct investment has a large effect on domestic investment, but instead in the form of portfolio capital seems to have no impact. Capital flows in the form of loans or debts fall somewhere in between.

3. METHODOLOGY

3.1 Estimation Technique

Structural vector autoregression (SVAR) models have become a popular tool in recent years in the analysis of the monetary transmission mechanism and sources of business cycle fluctuations. The identification problem is the same as that in a dynamic simultaneous equation model, but SVAR models take another approach to achieve identification by focusing on the role of shocks for the dynamics of the model. This approach avoids
some of the difficulties inherent in the traditional approach to identification, but it also implies that SVAR models cannot perform the same tasks as dynamic simultaneous equation models. In the field of monetary economics, for example, SVAR models are not well suited for policy simulation, which is a strength of the dynamic simultaneous equation models, but have instead an advantage in the analysis of the monetary transmission mechanism (Gottschalk, 2001).

The structural VAR model continues to be the most popular tool used by researchers in empirical investigation, for three major reasons. First, it can be easily used to investigate the average response of the model variables to a given one-time structural shock. Second, it allows the construction of forecast error variance decompositions that quantify the average contribution of a given structural shock to the variability of the data. Third, it can be used to provide historical decompositions that measure the cumulative contribution of each structural shock to the evolution of each variable over time. Historical decompositions are essential, for example, in understanding the dynamics of current account deficit spikes in the data (Nikolaychuk & Shapovalenko, 2013).

Main requirement that must be met to use SVAR model is data free from the of autocorrelation and heteroscedasticity problems. LM autocorrelation testing method shows if there is serial correlation at lag 1, but the serial correlation at lag 2 and so on significantly accept the null hypothesis (no serial correlation). The White heteroscedasticity method result shows chi-square value amounted to 520.0856 which can not reject the hypothesis of no cross terms. Therefore it can be concluded if the estimates are free of both issues.

3.2 Data Description and Unit Root

All data are taken from the World Bank World Development Indicators. We use data of \((y - y^*)_t\) i.e. the gap between world real output and domestic in the natural logarithm, \((r - r^*)_t\)
namely Japan real interest rate and domestic real interest rate, $r_{ct}$ namely the official exchange rate (in the natural logarithm of the index), and tariff is the tariff rate applied in all products weighted mean (%). The dependent variable is $ca_t$ namely the current account (percentage of GDP). All variable in annualy data form 1980 – 2014.

We use domestic real output relative to foreign real output and relative domestic real interest rate, as in the theoretical model. Intertemporal current account approach predicts that the current account is independent of global shocks and that the current account only responds to temporary country-specific shocks. The use of relative output and real interest rate has important implications as it permits the isolation of country-specific output and interest rate shocks. Glick and Rogoff (1995) obtained that country-specific shocks are more important determinants of the current account variation than global shocks. Relative output is derived subtracting from the logarithm of the index of domestic real output the logarithm of an index of foreign output.

Augmented Dickey Fuller (ADF) of stationarity test is performed to check whether the specification of equations should be written as first differences. Table 1 presents ADF unit root tests for the data. The results indicate that the null hypothesis of a unit root cannot be rejected for all the series against the alternative hypothesis of stationarity around a deterministic trend. Therefore, we conclude that the series are non-stationary in level.

<table>
<thead>
<tr>
<th>Table 1. Unit Root Test Result</th>
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<td>ADF</td>
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<tr>
<td>ADF</td>
</tr>
<tr>
<td>Level</td>
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<td>First difference</td>
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<tr>
<td>current account ratio</td>
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<tr>
<td></td>
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<tr>
<td>Δ output real</td>
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<td>tariff</td>
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<tr>
<td></td>
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<tr>
<td>dependency ratio</td>
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</table>

Constant and a time trend are included in the regression. Critical values (1, 5 and 10 percent) taken from MacKinnon (1996) * Rejection of the unit root hypothesis at the 10
percent level. ** Rejection of the unit root hypothesis at the 5 percent level. *** Rejection of the unit root hypothesis at the 1 percent level.

The first order integration of the study variables allows us to proceed with cointegration analysis, since first order integration is the necessary condition for cointegration analysis. SVAR method is also closely related to cointegration. Cointegration test was conducted to test the existence of long-term relationships between variables estimated. The existence of cointegration relationships is important in this model as the relations between variables that are based on economic theory. We applied the Johansen's Cointegration Test and test results are shown in Table 2.

### Table 2. Cointegration Test

<table>
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<tr>
<td>At most 1*</td>
<td>0.771015</td>
<td>110.4736</td>
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<tr>
<td>At most 2*</td>
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</tbody>
</table>

Trace test and max-eigenvalue test indicate 3 cointegrating eqn(s) at the 0.05 level. * denotes rejection of the hypothesis at the 0.05. ** MacKinnon-Haug-Michelis (1999) p-values.

As shown in Table 2 the Johansen's cointegration test shows that the study variables are cointegrated or in other word there is long term relationship across variables in this study.

### 4. RESULT AND DISCUSSION

#### 4.1 Stylized Fact of Indonesian Current Account
As mentioned earlier, the current account balance can expressed as the difference between the value of imports and exports of goods and services plus net factor payments and net transfers. As the trade balance tends to be the largest component of the current account, a current account deficit generally implies a trade deficit, although this need not be the case as countries also earn and pay income and send and receive transfers, most commonly in the form of interest and dividends and remittances. Second, the current account balance can also expressed as the difference between national saving and investment (both public and private). As such, the current account balance indicates the change in a country’s position as international net debtor or creditor.

Indonesia is experiencing its most sustained stretch of current account deficits (CADs) since the Asian Financial Crisis, with twelve consecutive quarters of deficits. Even so, this series of deficits is relatively brief compared to its stretch of CADs before the crisis. Since then Indonesia has undertaken significant reforms aimed to mitigate some of the vulnerabilities that affected it so severely in the Asian Financial Crisis. Those reforms likely contributed to its comparatively robust performance during the Global Financial Crisis (Ford, Alifirman, & Irawan, 2015).

Source: World Development Indicators, World Bank, 2016
Figure 1. Indonesian Current Account Expressed as Export - Import Difference (% of GDP)

Figure 1 shows Indonesian current account which expressed as exports and imports difference (net trade balance). Prior to 1997, the Indonesian current account deficit prolonged although Indonesia tend to experience a surplus in its trade balance during this period. This phenomenon is similar to those presented by Moreno (2007). At the time of the financial crisis in mid-1997, the current account Indonesia crept up and is always a surplus after it. In 1997/1998 countries in Asia have to face the economic crisis that started with the collapse of the Thai Baht. Indonesia among the countries worst affected. According to the agreement with the International Monetary Fund (IMF), significant reforms to trade policies are taken to reduce tariff and non tariff barriers and encourage exports. The government lowered various import tariffs, eliminate trade obstacles affecting import licensing, trade monopoly, and marketing agreements. Government is also committed to eliminate export taxes and export obstacles gradually. Plus a very sharp depreciation of the rupiah against the dollar makes exports become fueled ride.

Indonesia’s current account fell into deficit in late 2011 for the first time since the 1997/8 crisis. Current account decline in this time is said to be due deterioration happening in the balance in goods and services trade. The recent shift into deficit has been based on two structural developments and a combination of adverse exogenous and policy shocks (Varela, Nedeljkovic, & Savini Zangrandi, 2015). First, since the early 2000s Indonesia’s economy has grown faster than its major trading partners. Second, while investment growth has been generally strong, gross national saving have stagnated around 32 percent of GDP since 2009, dropping to 30 percent in 2013. Third, Indonesia was hit by a major terms of trade shock as the end of a decade-long commodity “super-cycle” hit exports prices, leading to a sizable drop in the value of Indonesia’s commodity exports. The shock was compounded, until mid-2014, by sustained high oil prices relative to non-oil commodities and strong domestic demand for
heavily subsidized fuel, as the country recorded a growing oil and gas trade deficit, having become a net oil importer in 2004. Finally, the implementation of the partial ban on raw mineral exports in January 2014 reduced revenues from this source.

Indonesia’s policymakers have long been aware that fuel subsidies have contributed to this pressure on the trade balance. By diverting national savings toward the subsidisation of energy consumption, they have distorted consumption and investment decisions and weighed on growth. Accordingly, the 2015 structural reforms removing the government subsidy on gasoline and changing to a fixed diesel subsidy will contribute positively to perceptions about Indonesia’s growth potential and the sustainability of the current account deficit (Ford, Alfirman, & Irawan, 2015).

![Figure 2. Indonesian Current Account Expressed as Saving – Investment Difference (% of GDP)](image)

Source: World Economic Outlook, International Monetary Fund, 2016 and World Development Indicators, World Bank, 2016

Figure 2 illustrates the current account if it is expressed as the difference between saving - investment. The movement of current account graph just looks like a reflection of saving - investment chart. As the offer domestic savings cannot meet the
needs of investment, capital inflows from abroad will balance these two. These results are similar to the of Ford (2015) and Varela (2015) opinions which emphasizes if at a high level, the reduction in the current account balance is due to a combination of very strong private investment and public sector dissaving. A current account deficit itself is merely reflective of the economy-wide set of investment and consumption possibilities and is not inherently problematic. When viewed in this light, the issue of the ‘sustainability’ of the current account deficit is moot, as long as it is the result of productive consumption and investment decisions then, in aggregate, the external position ought to be ‘sustainable.

A comparative look of the two figures, the movement of Indonesian current account can be said experienced two waves. In the early 1980s until the phase prior to the crisis, Indonesian current account deficit is due to the large investment needs compared to domestic savings that are not able to fulfill, so that the flow of foreign capital needed to finance the development. After the financial crisis in 1997an, the current account is more driven by the trade balance and its contributing factors, including the terms of trade and oil subsidies.

As the current account turned negative, financing has come to rely increasingly on portfolio and “other” investments (as opposed to foreign direct investment), exposing Indonesia to short-term financing constraints. Short-term external funding pressures could therefore emerge not only from a reduction in the availability of external financing relative to the current account deficit, but also external debt amortizations (Ford, Alfirman, & Irawan, 2015).
4.2 Empirical Result

The analysis presented in this paper suggests that Indonesia’s recent current account deficit results from the interaction of factors that can be grouped into three: external shocks, domestic policies, and stage of development and demographics. In this section we examine the impulse responses for current account in response to these three group factors. External shocks are indicated on the gap of Indonesia and Japan real interest rate as well as the gap of Indonesia and the world output to control the shocks that come from home and abroad. Domestic policies are reflected by the amount of tariff and the official exchange rate. Demographic change itself reflected in the dependency ratio that illustrates the magnitude of the portion of savings that can be formed in the economy.

Using Choleski decomposition on a SVAR model, response of current account to various shocks can be seen from the results of the impulse response function analysis (IRF). In each window, the dark line represents the point estimate and the dashed lines exhibit 95 per cent confidence bands constructed by a non-parametric bootstrapping exercise.
An increase in the current account ratio is only statistically significant for four years after the shock. After the fourth year, the shock in the current account balance does not seem to significantly affect the current account movement so it can remain in equilibrium pattern. These results are consistent with the theory, if the current account surplus will initially responded to the decline in the current account to maintain its balance. The biggest deficit will occur in the third period after the shock, which will then be pushed up to reach the equilibrium value initially.
Figure 5. Response of Current Account to GDP Difference

GDP difference is gap between world output and domestic output. As mentioned earlier, this variable intended to counter the influence of global shocks by controlling country specific shock. The increase in world output (relative to domestic output) initially pushed the deficit in the current account and statistically significant until the fifth year before returning pushed the current account surplus. The response shown by the current account balance as a result of shock on output gap tends to be slow and smooth running.

Tariff effect looks more ambiguous than two previous shock effects. In the short term, the increase in tariffs will lead to a surplus in the current account, although only for two periods. This could be due to the tariff, the domestic industry can be protected and encourage more exports. However, the tariff policy cannot always bring in surplus. The highest surplus will be received in the second or eleventh periods, and the current account return to deficit slowly. This result confirms if the tariff policy does not provide a positive influence on the current account movement, because it will reduce the performance of international trade and comparative advantage of Indonesia's export products in the world market. Moreover, with the deepening of Indonesian market integration with the global international trade.
IRF current account in response to real interest rate gap between Japan and domestic real interest rate shows if an increase in abroad real interest rate (relative to domestic) will encourage the expansion of the current account surplus in both the short and long term. This was due to an increase in abroad real interest rate will be responded by the flow of capital outflows to search for higher yields. Reaction of current account looks very quick in responding to changes abroad interest rates. It shows if the global
shock that occurs in monetary sector will respond instantly by domestic economy rather than global economic shock that come from the real sector. Although the current account response is very fast, but the magnitude of the change was not significant.

Response to exchange rate

![Graph showing response to exchange rate]

Source: author’s calculation

**Figure 7. Response of Current Account to Exchange Rate**

Rupiah depreciation (with the increase in the exchange rate against the dollar) instantly responded with the enlargement current account deficit until the third period after the shock occurs. Start the fourth period, the current account rose slowly boosted due to the depreciation will encourage exports greater than imports, but slowly back to the equilibrium value initially. Shock on the exchange rate looks responded very quickly by the current account, but it also into its equilibrium pattern initially quickly.
Changes in demographic composition seen have no significant effects on the Indonesian current account balance movement in the long term. Dependency ratio increase, which means more ratio of non-productive age population (aged <15 years and > 64 years) to total population of productive age (15 - 64 years) will encourage the current account surplus. Modigliani’s life cycle hypothesis suggests that households at working age are the prime net savers of societies, while young households are likely to be borrowers and old-age ones are likely to be dissevers. Thus we expect youth and old-age dependency to have negative impacts on the current account balance, however this is not the full story (Graff, Tang, & Zhang, Does Demographic Change Affect the Current Account? A Reconsideration, 2012). An increase in the dependency rates is also expected to negatively affect the demand for domestic investment. Slower labor force growth and lower expected output growth will decrease the rates of return on investment. Unless a (labor-augmenting) technological progress accelerates, domestic investment demand must decline. However, in the short run, investment increases may result from the need to substitute capital for a falling supply of labor input (Kim & Lee, 2008). The effects of the dependency variables on the current account are equal to the net of their effects on saving and domestic investment. Hence, the impact of the increased dependency on the current account balance is determined by the
relative force of changes in national saving and domestic investment. An increase in the dependency rates, if it lowers national saving rates faster than domestic investment, would adversely affect the current account and vice versa.

Further we analyzed the variance decomposition analysis in SVAR framework, which explains how much of the forecasting error variance of current account can be explained by its own innovations and changes in other variable.

Table 3. Current Account Variance Decomposition

<table>
<thead>
<tr>
<th>Period</th>
<th>Curr. Account</th>
<th>GDP Diff</th>
<th>Tariff</th>
<th>Real Interest Difference</th>
<th>Exchange Rate</th>
<th>Dependency Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>29.7</td>
<td>3.7</td>
<td>1.7</td>
<td>2.0</td>
<td>53.1</td>
<td>9.9</td>
</tr>
<tr>
<td>2</td>
<td>20.7</td>
<td>7.0</td>
<td>4.5</td>
<td>3.8</td>
<td>53.6</td>
<td>10.5</td>
</tr>
<tr>
<td>3</td>
<td>20.0</td>
<td>11.7</td>
<td>5.0</td>
<td>3.4</td>
<td>49.8</td>
<td>10.1</td>
</tr>
<tr>
<td>4</td>
<td>18.2</td>
<td>16.1</td>
<td>7.5</td>
<td>3.3</td>
<td>45.5</td>
<td>9.4</td>
</tr>
<tr>
<td>5</td>
<td>16.1</td>
<td>19.7</td>
<td>8.9</td>
<td>6.0</td>
<td>40.4</td>
<td>8.9</td>
</tr>
<tr>
<td>6</td>
<td>14.8</td>
<td>21.9</td>
<td>8.1</td>
<td>9.2</td>
<td>37.8</td>
<td>8.2</td>
</tr>
<tr>
<td>7</td>
<td>14.1</td>
<td>23.9</td>
<td>8.0</td>
<td>9.7</td>
<td>36.5</td>
<td>7.8</td>
</tr>
<tr>
<td>8</td>
<td>13.7</td>
<td>25.6</td>
<td>8.3</td>
<td>9.4</td>
<td>35.5</td>
<td>7.5</td>
</tr>
<tr>
<td>9</td>
<td>13.2</td>
<td>26.6</td>
<td>9.2</td>
<td>9.1</td>
<td>34.5</td>
<td>7.4</td>
</tr>
<tr>
<td>10</td>
<td>12.7</td>
<td>26.3</td>
<td>12.5</td>
<td>9.1</td>
<td>32.2</td>
<td>7.7</td>
</tr>
</tbody>
</table>

Source: author’s calculation

Variance decomposition in Table 3 suggested if Indonesian current account movement mostly driven by exchange rate changes. Although the effect is getting smaller over time, but the current account percent variance due to exchange rate remains the largest for 10 periods. This indicates if a policy that relies on the stability of the exchange rate will be the most effective policies to maintain the Indonesian current account stability.

Percent current account variance due to changes in foreign output (relative to domestic) appears to be raising most. On the other hand, the current account variance due to real interest rate is also increasing, but with smaller changes. The findings were
similar to the results of Ferrero et al (2008) analysis which states that international variables behavior (one of which is the current account) are relatively insensitive to changes in monetary, unlike what happened in real variables such as output and inflation. In terms of the elasticity of the current account changes caused by changes in monetary variables (real interest rate) is relatively smaller than if there is a change in the real sector (output).

A change in tariff is the most minor shocks influence in the current account balance, especially in the short term. Notwithstanding the effects of tariff in the long run will be even greater. This indicates if the process of trade and economic integration will have a significant effect on the Indonesian economy, though the effect is not instant. Dependency ratio has a relatively large influence on the Indonesian current account movement, but tends not effects significantly.

5. CONCLUSION

Financial stability is difficult to define but generally speaking if financial system stability can be characterized as stable in the absence of excessive volatility, stress or crises. Basically measurement is focused on six sectors, one of which can be accessed through the external sector is reflected through the current account as analyzed in this paper. The method used is SVAR meant to see how the Indonesian current account response to the existing shocks.

Variables which indicated be shocks here is the official rupiah exchange rate against the dollar, the gap between the world's output to domestic output, real interest rate gap between world (in this case Japan) with domestic, tariff, and the dependency rate ratio. The whole variables are to accommodate the possibility of the current account movement phenomenon from two different viewpoints, namely the import - export and saving - investment. Since the factors that are likely affect the position of these two need to be analyzed further.

The study shows that if the current account Indonesia tend to be unstable in the sense that is very responsive to a wide
range of shock that occurs, both from within and from abroad. Its ability to return to the early equilibrium value is also very slow. Indonesia's current account deficit picture also more reflects saving positions which lower than investment needs. This may indicates a growing economy that requires capital inflows from abroad as a source of financing. However, it should be underlined if that goes then is the short-term financing in the form of a portfolio, rather than foreign direct investment, the current account deficit need to be aware of the possibility of capital reversal that could causes financial instability.

The analysis showed the five shocks observed; the exchange rate had the highest impact. Lee and Chinn (1998) found that permanent shock in productivity have large long term effect on the real exchange rate. These results explain if the effect of exchange rates on current account Indonesia are causing changes in the position of saving - investment, rather than because of the competitive issues in international trade. Dependency ratios have relatively smallest influence on the Indonesian current account movement, and tend to be less significant. This result shows the changing demographics have not become an important issue in assessing the current account in Indonesia.

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Dynamic System

to Measure Economic Crisis in Indonesia

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Abstract

Financial stability influence economic condition. Economic crisis that had happened at 1997-1998 in Indonesia triggered by financial condition that was not stable. It stimulates the researchers to study more. Since financial condition is a foundation in a country. So if economic crisis happened then many sectors will get huge impact of it. Financial stability means variables as export-import, GNI, GDP and inflation in a good range. Due to the financial condition consist of dynamic variables then to measure its stability the dynamic system is needed. The financial stability will be tested using time series analysis and dynamic system which is optimized by genetic algorithm. In this research gave result around 80% - 90% for accuracy data GNI, GDP and inflation. Meanwhile, the accuracy of data export - import around 40% - 75%. These results proved that the dynamic system able to fit data in finding historical pattern with tolerance error.
1. INTRODUCTION

Financial stability is a significant problem that a country meet. Due to, it holds people necessity to continue their economic life. Because of that, economic is a study which involve many aspect that will bring into dynamic condition. This condition based on data economic indicator. So that, research to measure economic crisis in dynamic system still emerge until now. Research about it could be found from Arthur (2013), Vlad (2010), Guegan (2009), Goojier (2006), Parlitz (2005). Unfortunately, the measure to predict economic crisis need more concern not only from the dynamic of mathematic equation but also the better result of accuracy. Since, this issue have to solved while measure the real economic condition then. In Indonesia, economic indicators lay in data per year about inflation, GDP, GNI and export-import [18]. In other word, it can be said these indicators represent the condition of economic in Indonesia indirectly [21]. So that, the dynamic system would be presented by capture of the time series data leading of economic indicators that would been optimized by optimization algorithm.

2. LITERATURES

Dynamic System to Measure Economic Crisis

Dynamic system is dealing with the value of states in a system over time. It purposes in getting value of characteristic to measure economic crisis in Indonesia with any fluctuate condition [12]. On the other hand, dynamic system are a computer simulation modeling for studying and managing complex feedback systems, such as economic systems [13]. Use of the data indicator in dynamic system is to see the dependencies each other. In order that, the system in this research will be built using the following model dynamic:
\[
x(t) = [Ax(t) + Bx(t)] - [Cx(t) + Dx(t)] - [Ex(t) + Fx(t)]
- [Gx(t) + Hx(t)] - [Ix(t) + Jx(t)]
\]

(1)

Five economic indicators involve in inter dependent dynamic system. Stability of economic indicates economic situation that did not trigger to crisis since it is signed by value of economic indicator lay on in certain. This statement emphasize that this research did not concern to make early warning system of economic crisis. For example, value of inflation in Indonesia is in 1% - 5%. Then, if value of inflation starts to increase or even increase sharply, then economic condition head for unstable. Resume of instability in dynamic system when one economic indicator need to be observed with other indicator while measure economic crisis. Because of statement unstable cannot be measured by one indicator only.

Figure 1 visualizes the condition of economic condition in Indonesia during 1980 – 2020. It shows the instability value of Import, export, GNI, GDP and inflation in 1997 – 1998. From the fact, in that year (1998) Indonesia has experience economic crisis. Early visualization and analysis show that to conclude sign of crisis could be detected by outlier in the data time series, because it is show unusual data movement and this is aim to signaling that crisis happen.
3. METHODOLOGY

In this research, dynamic system which can measure economic condition using data time series that embed in dynamic model which optimized using genetic algorithm illustrate in the diagram block below. The system was divided into two main processes: *first*, analyze of chaotic data time series to fit the data history; *second*, using dynamic non-linear mathematic model that running in genetic algorithm to get best accuracy.

Figure 1. Influenced by Economic Indicator to Measure Economic Crisis in Indonesia
This research had been implemented using Matlab. The dynamic of chaos and complex range of data economic indicator will be solved by non-linear differential dynamic that hybrid with time series prediction and optimized by genetic algorithm (GA). GA is algorithm optimization that good in handling random search heuristically. Parameter in GA, recombination and mutation are the most influence natural selection in GA, will set into best individual that can found historic optimal. Whole of implementation dynamic system could be seen in Figure 4.
The system start from input data training into genetic algorithm namely initialization population. Here, the population is created to get the individual that will be suspected to be the best. Operator genetics about representation individual, population initialization, recombination, survivor selection and individual evaluation. To represent individual become chromosome used real representation. Process representation of chromosome using element matrix from equation (1). The structure of chromosome is $h_{xh} + h_{xp}$. Population initialization is to arouse population that fill amount of chromosome, where every chromosome consists of number of gen input that needed is size of population and sum of gen.

Second, five of economic indicator as data train input into the system. Here, it will be calculated the small error using fitness function. Repeat until the fitness function gets the best value. The fitness equation is showed below.

Figure 4 Dynamic System that Optimized using Genetic Algorithm
\[ f = \frac{1}{(E + b)} \tag{2} \]

Where \( b \) is the smallest number (avoid divided by 0); and \( E \) is absoult square error of prediction fault toward data actual. With the equation of \( E \) is:

\[ E = \sum_{i=1}^{N} (y_n' - y_n)^2 \tag{3} \]

Where: \( N \) = Total of prediction data; \( y_n' \) = data result of predict; and \( y_n \) = data actual.

Third, after get value of fitness, the individual will select the next parent. Where selection parent included the important thing to get the best individual at system. After the parent was founded, then the system will do the recombination to get the child to the next generation. Result of the child can be good by doing mutation. Because, it is the other way to get the best individual then by natural selection. From this population will be see the best individual that survive from the selection of loop evolution. If the generated in GA has finished yet. Then repeat all the step above.

After the loop evolution done, the system had found out the best coefficient to dynamic model and calculates the result of error training use MAPE. The calculations of accuracy system predict was used the equation below:
4. RESULT AND DISCUSSION

To measure the performance of the system, namely accuracy, need experiment scenario from genetic algorithm. These scenarios consist of parameter below.

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total gen in chromosome</td>
<td>TotalGen = 3 + 5*(7<em>GenPerVar) + 5</em>GenPerVar;</td>
</tr>
<tr>
<td>Total of chromosome in population</td>
<td>Population = 100;</td>
</tr>
<tr>
<td>Probability of recombination</td>
<td>Pcross-over = 0.2 / 0.8;</td>
</tr>
<tr>
<td>Probability of mutation</td>
<td>Pmutation = 0.2/0.8;</td>
</tr>
<tr>
<td>Iteration</td>
<td>MaxGeneration = 100;</td>
</tr>
</tbody>
</table>

This claimed are based on trials and errors during the phase training. The best result from this scenario could be seen below. In order to see the result of indicator that had been measured clearly, all of indicators did not show completely in the graphic.

Analysis from the result are:

1. The system gives the best accuracy to data import and export around 40% - 75%. This was caused by the huge range of the data actual (event data train, test and predict). It is means that dynamic system need more rigid mathematical model to fit the data.

2. The accuracy is 80% - 90% for data GNI, GDP and inflation. It was triggered by the data has a smooth distributing. Because of that the dynamic system can find the best coefficient with the smallest error from data actual.

3. Both from the result, it can be seen that the system is able to measure sign of crisis. It was signed in the figure 7, 8, 9. The system shown the sign of crisis happened which could be marked by significant increasing of data after that value of the data would decrease suddenly. The product is the crisis will occur.
4. The result influenced by parameter optimization of genetic algorithm namely cross over and mutation. By them, it will impact new generation with the best individual in population. So, if the parents are best individual, then the child could be the best individual of the next parents. Finally, the last population will be the best individual, and it will give the best coefficient which has the small error in fitting data. The result is measure with accuracy.

![Import](image1)

**Figure 5. Dynamic System to Measure Economic Crisis using Data Import**

![Export](image2)

**Figure 6. Dynamic System to Measure Economic Crisis using Data Export**
Figure 7. Dynamic System to Measure Economic Crisis using Data GNI

Figure 8. Dynamic System to Measure Economic Crisis using Data GDP

Figure 9. Dynamic System to Measure Economic Crisis using Data Inflation
5. CONCLUSION

Dynamic system should concern about the range of the data real while measure economic crisis. It is really important since data of economic have chaos and complex aspect. Because of that, the results of accuracy differ between data export – import and GNI – GDP – inflation. In fact, the fluctuated range of data cannot be avoided. Besides, the dynamic system should prepare for more flexible input. So that, genetic algorithm that optimized to fit the data need other dynamic differential non-linear model. Due to, the parameter optimization could present better accuracy.

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Household Security
Household Economic Security Across Cohorts

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The paper is based on the findings from the research project financed by the National Centre for Science (DEC-2011/01/B/HS4/03239)
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Abstract
The paper is aimed to explain differentiation in economic security of households through cohort differences. Identifying cohorts is based on common educational and professional experiences. The research introduces the concept of economic resourcefulness defined as the capability to make economic decisions that contribute to economic security of a household. Economic security of a household is defined as the ability to achieve income necessary for covering household needs at its suitable level and to create financial reserves to be at disposal in case of unfavorable accidence. The research uses an exploratory analysis based on structural equation modeling. The questionnaire survey carried out in Poland in 2013 is a source of data for observed variables in an empirical model of economic security. The findings confirm that common educational and professional experiences, controlling for economy conditions, influence economic resourcefulness of household’s members and, as a consequence, their economic...
security. The conclusion, however, refers to the Polish society and socio-economic development experienced by cohorts of Poles since 1990.

Keywords: Security, Household, Cohort, Resourcefulness  

JEL Classification: D14

1. INTRODUCTION

Economic security of households is one of financial stability dimensions. The economic security at a microeconomic level influences the welfare of individuals, individual identity and behavior in the labor market and at a macroeconomic level is the primary goal of the state and consumes a significant portion of public expenditure. Carrying out monetary and fiscal policies as well as using some macroprudential tools such as loan-to-value (LTV) and debt-to-income (DTI) ratios require information on economic decisions made by households which contribute to security of a family.

The purpose of the paper is to find out differences in economic security across cohorts. It is presumed that common educational and professional experiences, controlling for economy conditions, influence economic security of households. Poland is a case used to illustrate an approaching to economic security suggested by the paper.

The paper structure is as follows: the definitions of economic security suggested in the literature are presented in the second section; the third section covers a research hypothesis, objectives, the definitions of the main concepts, a description of a conceptual model as well as an empirical model; the research results are discussed in the forth section; and finally conclusions and research limitations are in the fifth section.

2. LITERATURES

Twenty-first century has brought a wider research related to economic security. Initially, the researchers focused on economic risk. Hacker, in his well-known book "The great risk shift. The
New Economic insecurity and the decline of the American Dream” (2006) stressed that for Americans income inequality has become less of a problem, and on the first plan came the fear for the future life of their families. The reason for this fear has become a very significant increase in the volatility of family income and the increase in risk associated with a decrease in the value of assets. The works of Hacker (2006, 2007) initiated a wave of empirical research on the trends of changes in income (Jacobs 2007). Consequently, researchers began to shift attention from the risk in the direction of economic security.

In the literature economic security is usually determined by the conditions required for sense of security. Beeferman (2002, p. 1) proposes a practical definition of what it means that people have a sense of economic security. They need assurance that in the short term they will be able to meet basic needs and in the long run – that they gain a well-paid job, will be able to improve the qualifications and will have sufficient financial resources to buy a flat or a house, start a business, start a new career and that these resources will allow them to survive the changes and crises in their lives and ensure a high quality of life when retired.

The report, “By a Thread: The New Experience of America's Middle Class” (2007) prepared jointly by the Demos: A Network for Ideas and Action, and The Institute on Assets and Social Policy at Brandeis University, an index of security of the middle class was based on responses to the question: what should have the middle class to feel safe in an economic sense? The answer is as follows: financial assets, education, income and health care for all members of the family.

International Labour Organization (www.iло.org) in the ILO Socio-Economic Security Programme has adopted the definition of “economic security”, which indicates a number of conditions, fulfillment of which can be identified with a sense of security. Economic security in this definition consists of two parts: the basic social security and work-related safety.
Summing up, in the short term protection against adverse situations are: a stable income from work or other sources (equity, real estate), insurance (private and social), liquid resources, including precautionary savings, human capital, social capital and common equity. In the long term, economic security can result also from ownership of less liquid assets (houses, flats, durable goods), but the most important components of economic security are the stability of geo-political situation and favorable demographic trends.

3. METHODOLOGY

3.1. Purpose, Hypothesis and Objectives of Study

In the paper economic security of households is defined as the ability to achieve income necessary for covering household needs at its suitable level and to create financial reserves to be at disposal in case of unfavorable accidence (sickness, job loss, family breakdown).

The research introduces a concept of economic resourcefulness to explain the perception of economic security. Economic resourcefulness is defined as a set of family member capabilities to make economic decisions - in the fields of labor, saving, investing, borrowing and insuring – aimed at building economic security of a family.

The purpose of the paper is to find out differences in economic security across cohorts. It is presumed that common educational and professional experiences, controlling for economy conditions, influence economic resourcefulness of households and as a consequence their economic security. Poland is a case used to illustrate an approaching to economic security suggested by the paper.

A hypothesis verified in the paper states: *There are differences in economic security of households which can be explained by socio-economic development experienced by different cohorts.* The detailed objectives are: (i) to build a conceptual model of economic security; (ii) to
measure economic security across cohorts; and (iii) to identify cohort differences in: 1) the relationships between variables in empirical models of economic security; 2) the resourcefulness effects; and 3) changes in mean values of economic security, by educational level.

3.2. A conceptual model of economic security

A conceptual model of economic security, suggested in the paper, covers the antecedents of individual economic resourcefulness and economic security as a consequence of economic resourcefulness, as well as mediators.

Antecedents of Individual Economic Resourcefulness

Socio-economic status of parents and socio-economic development in which an individual has experienced in his life make him more or less resourceful economically. Parents’ educational attainment and their well-being have impact on economic decision made by their mature children.

Socio-economic development refers, in the paper, to educational and professional experiences as well as to economic conditions under which an individual enters a labor market, and a career stage of an individual during an economic disturbances.

Economic Resourcefulness

A resourceful individual has a stable, well-paid job and he is able to find additional work facing financial problems. He posses a real estate or/and valuable belongings which are insured. He is able to borrow money, if necessary, from bank or other sources. He invests in his children. His behavior, regarding saving and running up debts, contributes to economic security of his family.

Economic Security of a Household

Economically secure family meets its needs at an acceptable level. It is able to maintain its living standards in the closer and further future, to meet unexpected expenses, to survive from an unexpected decrease in household income and.
Mediators

There are two mechanisms, or mediators, included in the model. Educational and professional aspirations of an individual are a mediator of effects of parental socio-economic status on economic resourcefulness of a mature child. Health of a mature child is a second mediator that links both parental socio-economic status and socio-economic development with economic security of a mature child’s family.

3.3. Cohort-Sequential Design with Independent Samples

The accomplishment of the research aim requires proper design of the study. There are two constrains to consider: 1) in a simple comparison of persons who are at different ages at one point in time (cross-sectional data), age effects may be confused with cohort effects and 2) unfortunately in Poland there are no available longitudinal data connected with the paper scope.

The lack of longitudinal data implies a lack of information about personal developmental changes what it neglects the possibility to reveal cohort effects and age effects. The cohort effect is defined as the effect that having been born in a certain time, region, period or having experienced the same life experience (in the same time period) has on the development or perceptions of a particular group. These perceptions, characteristics or effects are unique to the group in question. In other words, a birth cohort experiences the same historical, social, and environmental events at the same age, potentially giving rise to unique, cohort- specific values, attitudes, and preferences. Age effects are variations resulting from the biological and social processes of aging specific to individuals, such as physiological changes and the buildup of social experience.

The solution which can reduce the single cross section studies limitation is cohort-sequential design with independent samples. Admittedly such a design does not give full information on intra-individual change and inter-individual differences across generations. However, cohort-sequential design with independent
samples allows to differentiate cohort differences and age differences controlling for history (Schaie, 1994, p. 51).

It is assumed the basis of personality is created until the age of 6 then the period of cohort feature creation follows and covers the age of 6–20. Between 15 and 20 the phase of cohort signal identification occurs thus the common cohort value pattern is formed.

The socio-economic context for differentiation of cohorts is connected with economic and social changes in Poland during transition from a central planned economy under the communistic regime to a market economy. The first stage of transition took place in the 90s, the second one covered the years 2000-2004 and it was aimed at the ultimate preparation of Poland to the EU accession in 2004. Since 2005 Poland has developed in a direction of an advanced market economy, although it still belongs to a group of emerging markets. The transition has resulted in three great changes in the economy and the society: 1) dynamic growth of private sector, (a contribution of the private sector to the GDP is dominate, small and medium size enterprises create the majority of jobs), 2) openness of the economy (FDI growth, high technology, the western style of management not only in foreign firms but also in domestic ones, two millions of Poles have found jobs abroad), and 3) very dynamic growth in a fraction of high educated people (a number of people in age of 25-64 with a tertiary level of education increased from 10% in 1995 to 22% in 2011 as well a number of mothers with a tertiary educational level increased from 6% at the beginning of the 90s to more than 47% in 2013 while a number of mothers with primary education/or even without any educational level attained declined in this period from 18% to 4%).

The research covers three samples of respondents which represent three cohorts named: cohort 1: “Children of transition”; cohort 2: “Youth of transition”; cohort 3: “Mobile-working-age-adults of transition”.

Cohort 1: “Children of transition” – respondents are characterized as follows: all levels of education attained in a market economy,
possibilities to study in the EU, difficult entry to the labor market after the financial crisis, professional training in an advanced market economy ("an advanced market economy" in comparison to the first stage of transition, not in comparison to the old members of the EU);

Cohort 2: “Youth of transition” – respondents are characterized as follows: secondary and tertiary levels of education in a market economy, easy entry to the labor market just after Poland’s transition to the EU (dynamic growth during 2005-2007), extended professional experiences and more or less stable professional carrier during the financial crisis;

Cohort 3: “Mobile-working-age-adults of transition” – respondents are characterized as follows: childhood in the communism time, all educational levels in the communism times, professional experiences achieved in the communism times, training at the first stage of transition, stable professional position during the financial crisis.

3.4. Data

The questionnaire survey is a source of data for observed variables. The survey was carried out by the professional polling agency in Poland in June 2013. The respondents were asked to express their opinions directly in the course of face-to-face interviews. The polling agency carrying out the survey has chosen respondents at random. The selection of the respondents had been representative due to the voivodship (Poland is divided into 16 administrative units called voivodships), age, gender and educational level attained. The whole sample covers 800 respondents in age between 25 to 64. This sample is divided into three cohorts. The cohort 1: “Children of transition” covers 215 respondents; the cohort 2: “Youth of transition” – 197 respondents; the cohort 3: “Mobile-working-age-adults of transition” – 388 respondents. General information on respondents in each cohorts is presented in Table 1.
Table 1. General Information on Respondents by Cohorts

<table>
<thead>
<tr>
<th>Information of Respondents</th>
<th>Name of Cohort</th>
<th>Age in 2013 (Year of the Questionnaire Survey)</th>
<th>Fraction of respondents with tertiary educational level attained, as % of respondents in the cohort</th>
<th>Mean monthly income per person in a respondent’s household (PLN)</th>
<th>Mean monthly income per household (PLN)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cohort 1 „Children of Transition” (N=215)</td>
<td>25-34</td>
<td>42%</td>
<td>1803</td>
<td>3816</td>
</tr>
<tr>
<td></td>
<td>Cohort 2 „Youth of Transition” (N=197)</td>
<td>35-44</td>
<td>28%</td>
<td>1343</td>
<td>4090</td>
</tr>
<tr>
<td></td>
<td>Cohort 3 „Mobile-Working-Age-Adults of Transition” (N=388)</td>
<td>45-64</td>
<td>13%</td>
<td>1550</td>
<td>3083</td>
</tr>
</tbody>
</table>

Source: Author’s calculation on a base of the questionnaire survey carried out in 2013

There is a considerable difference in an educational level across cohorts and much less visible differentiation in mean income. A fraction of respondents with tertiary educational level attained is more than three times higher in the youngest cohort (respondents in age of 25-34) in comparison to a fraction of respondents in the oldest cohort (45-64 years), 42% and 13% respectively, see Table 1.

3.5. Empirical Model

3.5.1. Estimation technique

Two main research concepts - economic resourcefulness and economic security – are latent variables. This suggests to use an exploratory analysis based on structural equation modeling (SEM) implemented by IBM SPSS Amos. Maximum likelihood is a method for estimating structural equation models. A structural equation model (SEM) is build separately for each cohort and estimated by the data for this cohort. Each SEM is constructed to
specify hypothetical relationships among variables: 1) how the latent (or unobserved) variables can be related to each other (this part of the model is called the structural model) and 2) how the observed variables can depend on the latent variables (this part of the model is called the measurement model).

The structural model (the relationships between the latents) for each cohort covers the same six latent variables. The set includes: (i) Socio-economic status of respondent’s parents; (ii) Aspirations of a respondent; (iii) Economic resourcefulness of a respondent; (iv) Propensity to save; (v) Propensity to run-up-debts; (vi) Economic security of a respondent’s household.

3.5.2. Measures

The measurement model for each cohort consists of six distinct measurement submodels which specify how each of the six latent variables influences a group of observed variables. The details of all variables used on SEM model are presented on Table 2, and is available on the author.

Some of the observed variable are based on responses to the question in the questionnaire survey. We employ several measures to proxy certain variable, for instance on describing the best the way of managing the household income, we use the following 10 (ten) options, including the ‘no answer’.

1. There is enough for everything and for saving for the future
2. There is enough for everything without renunciation but no savings for the future,
3. We live economically and there is enough money for everything,
4. We live economically to save for major spending,
5. There is enough money for cheep food, clothing, apartment rent and installment of credit repayment,
6. There is enough money for cheep food, clothing, apartment rent but not for installment of credit repayment,
7. There is enough money for cheep food and clothing, but not for apartment rent,
8. There is enough money for cheap food but not for clothing,
9. There is not enough money even for cheap food,
10. No answer

Measures of the observed variables are based on responses to the questions in the questionnaire survey. The majority questions refer to individual attainment/opinion/behavior of a respondent. Smaller part of questions concerns a financial situation of a respondent’s household, like income per person, a level of savings/total indebtedness, managing of household’s income. Regarding such questions it is assumed that responses given by a respondent are representative for her/his household as a whole (only one member of a household was asked).

The measures of observed variables are scaled:

1 – it means a high level of a variable
0 – it means a low level of a variable

For the questions with a choice of options:
EDU, Q31A, Q31B – 1 for a tertiary level of education while 0 for other levels
M22_2 – 1 for options 1-4 while 0 for options 5-8 (see the explanation for the variable M22_2 under Table 2)
Q12 – 1 for option 1 while 0 for options 2-3 (see the explanation for the variable in Table 2)

A few observed variables are measured in other way:

- Income per person in a household is measured in Polish currency, PLN, (in ln)
- Q5 - What unexpected expenses can you meet during few days without any loans and any financial support from the others? - is measured in PLN, (in ln)
- Q42 – a value of a respondent’s flat/house, PLN, (in ln)
- Q7 – a level of savings as a multiplicity of household’s monthly income
o Q10 – a level of total indebtedness as a multiplicity of household’s monthly income

o Q15 – measured in a number of months

The matrix of implied covariances for all variables in the model can be used to carry out a regression of the unobserved (latent) variable on the observed variables. The resulting regression weight estimates can be obtained from Amos and they are named the factor score weights. These factor score weights give regression weights for predicting the unobserved variables from the observed variables. A measure of a latent variable is a weighted sum of the individual observed scores using the factor score weights. In the paper the factor score weights are calculated separately for each cohort. For example, the measure of resourcefulness for an individual in the cohort “Children of transition” is the sum of observed scores computed as follows:

individual response to Q31A (1 or 0) x cohort-factor-score-weight for Q31A + …..

3.5.3. Model evaluation

All regression coefficients in each SEM estimated for the cohort are significant at the 0.05 level (a majority of them are significant at the 0.01 level). All covariances between the errors included in the model are significant at the 0.05 level.

Model evaluation is one of the most unsettled and difficult issues connected with structural modeling. The literature suggests several fit measures. In the paper the SEM estimated for each cohort is evaluated on a base of the following ones:

- **P** is a “p value” for testing the hypothesis that the model fits perfectly in the population.
- **CMIN/DF** is the minimum discrepancy, divided by its degrees of freedom. The ratio should be close to 1 for correct models.
- **CFI** is the comparative fit index. **CFI** values close to 1 indicate a very good fit.
• RMSEA - root mean square error of approximation - a value of the RMSEA of about 0.05 or less indicates a close fit of the model in relation to the degrees of freedom.

• PCLOSE - is a $p$ value for testing the null hypothesis that the population RMSEA is no greater than 0.05

The values of the fit measures used in the research are presented in Table 3. The evaluation results indicate a good fit of all three models

**Table 3. Summary of the Fit Measures**

<table>
<thead>
<tr>
<th>Model for the cohort</th>
<th>P</th>
<th>CMIN/DF</th>
<th>CFI</th>
<th>RMSEA</th>
<th>PCLOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children of transition</td>
<td>0.918</td>
<td>0.905</td>
<td>1.000</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Youth of transition</td>
<td>0.887</td>
<td>0.907</td>
<td>1.000</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Mobile-working-age-adults of transition</td>
<td>0.841</td>
<td>0.931</td>
<td>1.000</td>
<td>0.000</td>
<td>1.000</td>
</tr>
</tbody>
</table>

*Source: own calculation*

4. RESULT AND DISCUSSION

The exploratory analysis reveals some cohort and age differences. In comparisons made across large age spans can be assumed that the variance due to cohort far exceeds that due to age - this enables to identify magnitudes of generational (cohort) differences between “Children of transition” and “Mobile-working-age adults of transition” – while in comparison of closely spaced age levels it is reasonable to assume cohort differences to be rather small - this enables to identify magnitudes of age differences between “Children of transition” and “Youth of transition”.

Identifying cohort and age differences is based on comparisons in: 1) the relationships between variables in the SEMs estimated separately for each cohort (see Table 2); 2) standardized total effects of latent variables across cohorts (see Table 4), and 3) the mean values of economic security measures across cohorts (see Table 5 and 6).
4.1 Relationships between Variables in SEMs

In general, respondents in the cohort “Children of transition” (respondents in age of 25-34) are much better educated and much more familiar with products in a financial market (all levels of their education attained in the market economy, professional training in the advanced market economy) than respondents in the cohort “Mobile-working-age adults of transition” (shortly, “Adults of transition, respondents in age of 45-64).

This can explain a difference in the impact of “Propensity to save” on “Diversification in income sources of maintenance during retirement”. For the “Children of transition” (as well as for the cohort 2 – respondents in age of 35-44) diversifying long-term investment is one of direct measures of their behavior in saving process, while for the “Adults of transition” the impact is mediated by their opinion whether their well-being depends on themselves (“Do you think it is up to you how much money you will have in your life?), see Table 3.

Experiences of the “Children of transition” in a financial market make them more independent from the parental influence. This can explain why in their SEM “Propensity to run up debts” depends directly only on their “Resourcefulness”, while in the SEM of “Adults of transition” this latent is influenced additionally by “Financial problems of their parents”, see Table 3.

In general, comparison in the SEMs suggests that economic decisions made by the “Children of transition” depend directly on their own resourcefulness and the impact of parental socio-economic status on their decisions is only indirect, mediated by their “Aspirations” (however this indirect impact is the strongest in the cohort 1 because, parental status of respondents in the cohort “Children of transition” is much higher than in the cohort “Adults of transition” - mean value of the latent variable “Socio-economic status of respondent's parents” is 0,454 in comparison to 0,188). While in the SEM of the “Adults of transition” parental status influences directly two variables: the
ability to find additional job and a value of real estate possessed by a mature child. This statistical significance of parental support results from informal relationships among older members of the Polish society.

There is one more cohort difference linked with a perception of investment in children. For the “Children of transition” money spent on child development is one of resourcefulness measures, while for the “Adults of transition” investment in a child’s activities has been a matter of their aspiration, see Table 3.

### 4.2 Standardized Total Effects

A standardized total effect is a measure of both direct (unmediated) and indirect (mediated) effects of a variable A on variable B after standardizing all variables. See Table 4 that presents the total effect of each column variable on each row variable, for example the standardized total (direct and indirect) effect of “Economic resourcefulness of a respondent” on “Propensity to save” is 0.961. That is, due to both direct (unmediated) and indirect (mediated) effects of “Resourcefulness of a respondent” on “Propensity to save”, when “Resourcefulness of a respondent” goes up by 1 standard deviation, “Propensity to save” goes up by 0.961 standard deviation.
Table 4. Standardized Total Effects of “Economic Resourcefulness of a Respondent” and “Economic Security” Across Cohorts

<table>
<thead>
<tr>
<th>Economic resourcefulness of a respondent</th>
<th>Cohort 1: Children of transition (age of 25-34)</th>
<th>Cohort 2: Youth of transition (age of 35-44)</th>
<th>Cohort 3: Mobile-working-age-adults of transition (age of 45-64)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propensity to save</td>
<td>0.961</td>
<td>0.764</td>
<td>0.894</td>
</tr>
<tr>
<td>Propensity to run up debts</td>
<td>-0.533</td>
<td>-0.465</td>
<td>-0.258</td>
</tr>
<tr>
<td>Economic security</td>
<td>0.947</td>
<td>0.976</td>
<td>0.869</td>
</tr>
<tr>
<td>Diversification in income sources of maintenance during retirement</td>
<td>0.187</td>
<td>0.346</td>
<td>0.051</td>
</tr>
<tr>
<td>Purchases of insurance</td>
<td>0.518</td>
<td>0.442</td>
<td>0.353</td>
</tr>
<tr>
<td>Savings</td>
<td>0.572</td>
<td>0.405</td>
<td>0.433</td>
</tr>
<tr>
<td>Total indebtedness</td>
<td>-0.401</td>
<td>-0.260</td>
<td>-0.173</td>
</tr>
</tbody>
</table>

*The total effect of each column variable on each row variable after standardizing all variables. For example, 0.961 - a first figure in the Table 4: The standardized total (direct and indirect) effect of “Economic resourcefulness of a respondent” on “Propensity to save” is 0.961. That is, due to both direct (unmediated) and indirect (mediated) effects of “Resourcefulness of a respondent” on “Propensity to save”, when “Resourcefulness of a respondent” goes up by 1 standard deviation, “Propensity to save” goes up by 0,961 standard deviation.

Source: Author’s calculation

Figures in the Table 4 confirm that young people (in age 25-34, cohort 1) - better educated, with professional training in the advanced market economy, and having parents with higher socio-economic status— can make private economic decisions more rational than people in age of 45-64 (cohort 3). An increase in economic resourcefulness among these young respondents declines their propensity to run up debts as well as total indebtedness much stronger in comparison to these total effects.
among the oldest cohort of respondents (age of 45-64) – compare -0.533 to -0.258 and -0.401 to -0.173 in Table 4.

Two other visible differences refer to total effects of resourcefulness on purchasing insurance and diversifying retirement investments. The impact of resourcefulness in both cases is stronger for the cohort 1 than cohort 3 – compare 0.518 to 0.353 and 0.187 to 0.051 in Table 4. Moreover, the effects of resourcefulness on propensity to save as well as savings are the strongest for the youngest cohort.

4.3 Comparison in Mean Values of Economic Security Across Cohorts

The measure of economic security is calculated on a base of the SEMs for each cohort and it is normalized from 0 to 1. Higher value, higher economic security of a respondent’s household, see Table 5. Higher mean values of economic security for the oldest cohort (cohort 3) than for the youngest one (cohort 1) suggests an age difference rather than a cohort one. In general, people in age of 45-64 should be economically secure more than people in 25-34 because they have had more time to gather more wealth and pay out their loans. This conclusion is obvious.

Interesting figures are in Table 6 where the mean value of economic security for the cohort 2 (“Youth of transition” – respondents in age of 35-44) is a base for comparisons. The changes in mean economic security are differentiated across cohorts and by education level. The age difference is visible only in reference to people with low and very low educational level. They are more secure economically in age of 45-64 than people in middle age (cohort 2, age of 35-44). While the cohort difference can be recognized regarding people in age of 45-64 with tertiary and secondary levels of education. These people have the same economic security, in average, as people in a middle age (35-44 years).
Table 5. Mean Values of Economic Security Across Cohorts, by Educational Level

<table>
<thead>
<tr>
<th>Educational level of a respondent</th>
<th>Mean value of economic security of a household</th>
<th>Cohort 1: Children of transition (age of 25-34)</th>
<th>Cohort 2: Youth of transition (age of 35-44)</th>
<th>Cohort 3: Mobile-working-age adults of transition (age of 45-64)</th>
</tr>
</thead>
<tbody>
<tr>
<td>tertiary</td>
<td>0.607</td>
<td>0.707</td>
<td>0.718</td>
<td></td>
</tr>
<tr>
<td>secondary</td>
<td>0.449</td>
<td>0.593</td>
<td>0.567</td>
<td></td>
</tr>
<tr>
<td>basic</td>
<td>0.315</td>
<td>0.412</td>
<td>0.459</td>
<td></td>
</tr>
<tr>
<td>vocational primary</td>
<td>0.232</td>
<td>0.252</td>
<td>0.371</td>
<td></td>
</tr>
<tr>
<td>whole cohort</td>
<td>0.492</td>
<td>0.562</td>
<td>0.516</td>
<td></td>
</tr>
</tbody>
</table>

The measure of economic security is calculated on a base of the SEMs for each cohort and it is normalized from 0 to 1. Higher value, higher economic security of a respondent’s household.

Source: Own calculation

Table 6. Ratios of Mean Values of Economic Security Across Cohorts, by Educational Level

<table>
<thead>
<tr>
<th>Educational level of a respondent</th>
<th>Mean value of economic security of a household, as % of mean economic security of cohort 2</th>
<th>Cohort 1: Children of transition (age of 25-34)</th>
<th>Cohort 2: Youth of transition (age of 35-44)</th>
<th>Cohort 3: Mobile-working-age adults of transition (age of 45-64)</th>
</tr>
</thead>
<tbody>
<tr>
<td>tertiary</td>
<td>85.9%</td>
<td>100%</td>
<td>101.6%</td>
<td></td>
</tr>
<tr>
<td>secondary</td>
<td>75.7%</td>
<td>100%</td>
<td>95.6%</td>
<td></td>
</tr>
<tr>
<td>basic</td>
<td>76.5%</td>
<td>100%</td>
<td>111.4%</td>
<td></td>
</tr>
<tr>
<td>vocational primary</td>
<td>92.1%</td>
<td>100%</td>
<td>147.2%</td>
<td></td>
</tr>
<tr>
<td>whole cohort</td>
<td>87.5%</td>
<td>100%</td>
<td>91.8%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Own calculation on a base of Table 5

Educational and professional experiences of middle-age people (cohort 2) - secondary and tertiary levels of education in a market economy, easy entry to the labor market just after Poland’s transition to the EU (dynamic growth during 2005-2007), extended professional experiences and more or less stable professional carrier during the financial crisis – enable them
receive economic security at the same level like people 10-20 years older. This suggests that qualification of the cohort 2 must be higher than skills and knowledge of older people (cohort 3), even with the same educational level. This can be recognize as evidence of the cohort difference.

5. CONCLUSION

The paper is aimed to explain differentiation in economic security of households through cohort differences. Identifying cohorts is based on common educational and professional experiences. The research introduces the concept of economic resourcefulness defined as the capability to make economic decisions that contribute to economic security of a household.

The findings reveal first that economic decisions made by the members of the youngest cohort having educational and professional skills attained in a market economy depend directly on their own resourcefulness and the impact of parental socio-economic status on their decisions is only indirect, mediated by their “Aspirations”. While in the SEM of the oldest cohort parental status influences directly two variables: the ability to find additional job by a mature child and a value of real estate possessed by a mature child.

Second, an increase in economic resourcefulness among the youngest respondents declines their propensity to run up debts as well as total indebtedness much stronger in comparison to these total effects among the oldest cohort of respondents.

Third, total effects of economic resourcefulness on purchasing insurance and diversifying retirement investments are stronger for the youngest cohort than the oldest one.

Fourth, the effects of resourcefulness on propensity to save as well as savings are the strongest for the youngest cohort.
Fifth, educational and professional experiences of middle-age people (it means secondary and tertiary levels of education attained in a market economy, easy entry to the labor market just after Poland’s transition to the EU (dynamic growth during 2005-2007), extended professional experiences and more or less stable professional carrier during the financial crisis) enable them receive economic security at the same level like people 10-20 years older.

The research results confirm that common educational and professional experiences, controlling for economy conditions, influence economic resourcefulness of household’s members and, as a consequence, their economic security.

The research limitations should be emphasized. The conclusions refer to the Polish society and socio-economic development experienced by cohorts of Poles since 1990. More country studies are required to generalize the main conclusion that cohort differences explain differentiation in economic security of households.

REFERENCES


Regional Revitalization

Sharia Traditional Market Area: Revitalization of Traditional Markets in Maintaining Regional Financial Stability through Optimization Potential Waqaf

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Abstract
Facing the Asean Economic Community (AEC) in 2015 which demanded the liberalization of the flow of goods and services, especially alert to the entry of foreign retail business and the modern, the traditional market revitalization in Indonesia has significant importance in empowering Micro, Small and Medium Enterprises (UMKM) in Indonesia. Traditional markets as a reflection of the people's economy is the foundation for the life of the little people, the middle income who are engaged in the informal sector, micro, small and medium businesses that thrive and depend on traditional markets.
The bad image of the traditional markets in the society was also a factor increasingly waning existence of traditional markets in Indonesia, causing the shift of consumers from traditional markets to modern market. Poor market conditions, means incomplete, not product quality standards as well as the atmosphere uncomfortable and have still limited access to capital financing with low interest for traders, also became an obstacle. Required a concept and approach to redefine traditional market revitalization. Islamic economics as an alternative solution to the problems of this nation. On the other hand the problem to revitalize traditional markets requires considerable cost. However, problems such funds can be circumvented by exploiting the potential cash waqf funds.

Sharia Traditional Market Area is a solution to community empowerment effective and productive. Sharia Traditional Market Area has been built, will be managed professionally and in accordance with the values of shari'ah 'ah. Traditional Market Area Sharia will not only contribute significantly to community empowerment. But also can play a role childbirth featured merchants based on the values of sharia applicative program launched by the manager of Sharia Traditional Market Area.

Keywords: Traditional Market, Waqaf, Sharia Traditional Market Area, JEL Classification: G18, G21, G28

1. INTRODUCTION

Background

"And God justifies the purchase and Proscribe Riba" (Al-Baqarah; 275) Facing the Asean Economic Community (AEC) in 2015 which demanded the liberalization of the flow of goods and services, especially alert to the entry of foreign retail business and the modern, the traditional market revitalization in Indonesia has significant importance in empowering Micro, Small and Medium Enterprises (UKM) in Indonesia. Traditional markets as a reflection of the people's economy is the foundation for the life of the little people, the middle income who are engaged in the
informal sector, micro, small and medium businesses that thrive and depend on traditional markets.

Based on research conducted Rafinaldi (2006) and the fact of Kementrian Koperasi and Micro, Small and Medium Enterprises (UMKM) (2012) states that the optimism of UKM in Indonesia, among others: (1) its position as a major player in economic activity in various sectors: the number of UKM in Indonesia in 2011 reached 53,823,732 units or 99.99% of total business units with a donation of GDP at constant prices of 57.60% with a growth of 6.76% since the base year 2010, (2) the largest provider of employment reached 97.24% of labor force, (3) a significant player in the development of local economic activity and community development, (4) the creators of new markets and sources of innovation, and (5) contribution in maintaining the balance of payments through the activities of non-oil exports amounted to 187,441.82 billion or 16.44%.

But in fact, UKM in Indonesia are still struggling in various polemical issues in the arena of national economy. Sharif (2011) formulated had scales of priority problems faced by UKM in Indonesia today. The study was based on a decline in the average scale of business seen from the fixed price, the low index of well-being of UKM, as well as increasingly smaller role in the crop sector comestible, Porternakan, plantations and fisheries. One reason is the existence of traditional markets is fading in this era of global competition.

"A growing increasingly desperate parents". That's the nature of traditional markets on which the UMKM in Indonesia today. The rapid development of modern market with all the benefits a negative impact on the existence of traditional markets. Data from Ministry of Commerce noted that the number of traditional markets is now an 10,000-lived, while the modern market has already reached 14,000. Modern market totaled 14,000 is divided into 358 outlets in the form of convenience stores, minimarkets 11 569, 1,146 supermarkets, 141 hypermarkets and 260 shaped grocery store or wholesaler. Results traditional market
mapping conducted the Ministry of Commerce in 2010 to 4,000 markets in 12 provinces to 95 percent mention the age of the traditional market is already 25 years which means in a very fragile condition. Even the Deputy Minister of Trade, Krisnamurthi, traditional markets predict just be a memory the next 12 years if they are not made efforts to rebuild these markets (Windarto, 2012).

In addition, the negative image of traditional markets in the society was also a factor increasingly waning existence of traditional markets in Indonesia, causing the shift of consumers from traditional markets to modern market. Poor market conditions, means incomplete, not product quality standards as well as the atmosphere uncomfortable and have still limited access to capital financing with low interest for traders, also became an obstacle. According to data from Indonesia Market Vendors Association (LGAs) in 2008, the number of traditional markets there are 13,450 fruit market and approximately 4,707 or 35% of whom have been abandoned by the merchant. LGAs revealed, in Jakarta every year there are 400 stalls were closed because of competition from modern markets (Marsyahid, 2009). Wiboonpongse and Sriboonchitta (2006), Poseoro (2007), the research also revealed that internal factors may also lead to a serious waning existence of traditional markets, among others: poor management of the market, the inability to meet the needs of consumers, there are no economies of scale and collaboration with suppliers, infrastructure was minimal, traditional markets as "cash cows" for retribution, the proliferation of street vendors (PKL), and the lack of capitalization assistance.

In line with the foregoing, Nurmalasari (2007) revealed that there are several factors that significantly affect society as a consumer preference for shopping at traditional markets, among others, the quality of traded goods, hygiene traditional markets and convenience in shopping.

His research also revealed that people's income has no influence on his preference choose traditional market means
people are expecting satisfaction are met with maximum service condition rather than thinking about the price.

If it turns out to be explored deeper managerial side who have often neglected the development proved to have considerable influence on the waning competitiveness of traditional market today. You could say, lack of awareness is also a lack of knowledge of traditional market players become a factor if the service has been done is not oriented to the satisfaction or consumer preferences, but only to the extent the behavior of market participants traditional subsistence.

Whereas traditional markets have an important role that can absorb the labor force in large numbers, as a distribution center for goods and for economic growth that can develop both rural and urban regions. Research conducted by Alfian Tumbuan, et al (2006) about the significance of the traditional market in the city of Manado mention of the power market that is not owned by a supermarket, namely:

1. The strong fraternal relations with society, history, and culture,
2. free access to the market,
3. existence and presence in remote small town,
4. have loyal customers,
5. have diversified products and power to negotiate prices.

In addition, as disclosed by Jati (2012) states that the essence of economic transactions contained in the traditional market is a form of cooperation (cooperation), which is a pattern best practices in Indonesia. Traditional markets arising from the insistence of the local community needs rise to a social capital in the form of "Cooperation" and "trust" are not only focused on the advantages and economics gain from all parties but also to build ties of kinship and brotherhood. It is also called Clifford Geertz as the uniqueness of the economic pattern in Indonesia, Economic Bazaar.

Based on the above exposure, we need a concept and approach to redefine traditional market revitalization. Islamic economics as an alternative solution to the problems of this
nation. The problems mentioned above, can be overcome with how the government can provide containers as a means of empowering traditional market players who must not be separated in the corridors of Islamic economics.

Efforts to revitalize traditional markets often cause a problem before, during and after the execution took place. Instead of helping the people's economy, the revitalization of traditional markets often cause social conflicts causing long program increasingly abandoned even fail, call it market Klewer Solo, Pancur Pasar Batu, Deli Serdang. Even if revitalization is successful the results were often disappointing, that still lonely customers like Ayu Market, Market Nusukan, Sidodadi Market and Flower Market in Solo. The reason is that the general is a lack of transparency, the small role of traditional market players (both merchant and consumer), and revitalization is oriented mainly to the physical dimensions of the market such as buildings and infrastructure in the traditional market.

Of course, this revitalization issue into a dilemma that is very detrimental to both the traditional market players (in this case the trader and the consumer), the government and investors. Simalakama like fruit, as the revitalization of traditional markets which had occurred did not have a positive impact. If nothing is done, then the existence of traditional markets will continue to be undermined by the modern market. If you do then the threat of social conflict and the failure of revitalization was also overshadowing, so it would be a waste, especially the government budget.

On the other hand the problem to revitalize traditional markets requires considerable cost. However, problems such funds can be circumvented by exploiting the potential cash waqf funds, because there is no obligation to refund and provide certain profit level to wakif (which provides endowment funds) but channeling the profits to benefit the people and keep these funds in order not reduced. Until now, the management of cash waqf is still very less attention even though its potential is very promising.
It is necessary for the management of a professional through an approach that allows solving problems of revitalization of traditional markets that can be exploited for the benefit of the economy.

2. LITERATURES

Traditional markets

Traditional markets are traditionally selling place (hereditary), a meeting place for sellers and buyers where goods are bought and sold depending on consumer demand, the price set an agreed price through a bidding process. In general, traditional markets are point of sale materials basic needs. Sometimes traditional market activities within the limits specified time as the morning market, evening market, weekend market and so forth. Traditional markets are managed by the government or private amenities such as sheds, warehouses, stores, kiosks, public toilets at around traditional markets.

The process of buying and selling in the traditional markets take place humanely and communication with family values are high (source http://id.wikipedia.org). Meanwhile, according to the Presidential Decree of the Republic of Indonesia of 2007 No. 112 concerning construction, arrangement and development of traditional markets, decided that "traditional market" is a market that is built and managed by the Government, Local Government, Private, State Owned Enterprises and Regional Owned Enterprises including cooperation with the private sector with businesses such as shops, kiosks, stalls and tents owned / managed by small traders, medium-sized, non-governmental or cooperative with small-scale enterprises, small capital and with the process of buying and selling merchandise through bargaining. There is a striking difference in the characteristics between the traditional with the modern market in Indonesia as shown in table 1.


<table>
<thead>
<tr>
<th>No</th>
<th>Aspect</th>
<th>Traditional market</th>
<th>Modern market</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>History</td>
<td>Long evolution</td>
<td>new phenomenon</td>
</tr>
<tr>
<td>2</td>
<td>Physical</td>
<td>Less good, a good portion</td>
<td>Good and luxury</td>
</tr>
<tr>
<td>3</td>
<td>Ownership / institutional</td>
<td>Community property / bicycles, little private</td>
<td>Generally, individual / private</td>
</tr>
<tr>
<td>4</td>
<td>capital</td>
<td>Weak capital / subsidies / NGO / Instruction</td>
<td>Strong capital / driven by the private sector</td>
</tr>
<tr>
<td>5</td>
<td>Consumer</td>
<td>Middle down</td>
<td>Generally, the upper middle</td>
</tr>
<tr>
<td>6</td>
<td>Payment method</td>
<td>Feature served, bargaining</td>
<td>There are the self-service, definitely</td>
</tr>
<tr>
<td>7</td>
<td>The Land</td>
<td>State land, a little more privately run</td>
<td>Land of private / individual</td>
</tr>
<tr>
<td>8</td>
<td>Financing</td>
<td>Sometimes there is a subsidy</td>
<td>Nothing subsidy</td>
</tr>
<tr>
<td>9</td>
<td>Development</td>
<td>Generally done by government / village / community</td>
<td>Physical development is done by the private sector</td>
</tr>
<tr>
<td>10</td>
<td>Merchants who sign</td>
<td>Diverse, origin, sector informal to medium and large</td>
<td>The owners of capital are also merchants (Single) or several merchants formal medium scale up</td>
</tr>
<tr>
<td>11</td>
<td>Opportunities trader entry / Participation</td>
<td>Is the origin, (generally small traders, medium to large)</td>
<td>Limited, generally the owners of capital, or the upper middle</td>
</tr>
<tr>
<td>12</td>
<td>Network</td>
<td>Regional market, the municipal market, regional markets</td>
<td>System relating to corporations national and even foreign loans (Centralized management)</td>
</tr>
</tbody>
</table>


**The concept of Waqf and Its Potential in Indonesia**

Waqf etymology is al-habs (hold) ".. waqf are words yangberbentuk masdar (gerund) of the expression waqfu al-syai 'which basically means hold anything. Thus, the notion of waqf in the language is to hand over land for poor people to be detained. Thus defined as property that is held and detained others, like holding livestock, land and everything (Al Kabisi, 1977). Meanwhile, according to
Law No. 41 of 2004 on Waqf.

Waqf defined by legal act Wakif to separate and/or hand over part of their wealth either permanently or for a specified period in accordance with their interests for purposes of worship and/or general well-being according to sharia. While the decision fatwa Fatwa Committee Indonesian Ulema Council (MUI) on cash waqf decided that the waqf money (cash waqf) are waqf that a person, group of people, institutions or legal entities in the form of cash, including marketable securities, and the law jawaz (allowed). The use of cash waqf should only be channeled and used for things that are permitted by sharia and should guarantee its preservation, may not be sold, assigned, and/or inherited.

In the Qur’an there are some verses that are based as the foundation waqf command. ”You never come to virtue (perfect), before you spend sebahagian that which ye love. And whatever you spend, Allah knows.” (Qur’an, Ali Imran: 92).

Another verse says: "The parable (income incurred by) those who spend their wealth in Allah is like a seed that grows seven ears, in every ear a hundred grains, Allah magnifies (reward) for whom He will, and Allah is the area (his gift), the Knower." (QS. Al-Baqarah: 261).

There are three fundamental reasons why the Ottoman era jurisprudents arrange cash waqf buildings: first, the notion that mobile assets can be a waqf property. Second, assessment and acceptance of money as an asset moves. Third, the agreement on the provision of cash.

Meanwhile, there are four pillars waqf that must be met in berwakaf. First, people who berwakaf (al-Waqif). Second, objects diwakafkan (al-mauquf). Third, those who receive the benefit of waqf (al-mauquf ’alaihi). Fourth, lafadz or pledge waqf (sighah). In Act No. 41 of 2004, there are two additional things that have to be met: waqf property allotment and term waqf. In order to achieve the objectives and functions of waqf, according to Law No. 41 of 2004 on Wakaf, waqf property invested reserved only for five
kinds of things, namely: (a) facilities and religious activities; (B) the means and education and health; (C) assistance to the poor, abandoned children, orphans, scholarships; (D) progress and economic improvement of the people, and / or; (E) the progress of other public welfare that are not contrary to the sharia and legislation.

With the potential large population reached 237 million in the 2010 census, and the potential for world Muslims, then the potential endowment in Indonesia is something promising, especially when supported by their waqf Act No. 41 of 2004. Many Islamic banks nor the institution of waqf issued various products collected from the community. Baitul Mal Muamalat, for example, launched the Cash Waqf Muamalat (Waqtumu), Republika Dhuafa Wallet launched Tabung Wakaf Indonesia (TWI), and Pos Keadilan Peduli Umat (PKPU) launched a cash waqf.

With cash waqf is implemented, then the reception with these instruments being higher than other instruments such as zakat, infaq, sadaqah, or otherwise. Arena with cash waqf, the waqf instrument is no longer the monopoly of the "rich". Lower middle class can participate. If only there were 10 million only Muslim society that donating funds as much as Rp 100 thousand, it will obtain the endowment fund raising Rp 1 trillion per month (Rp12 trillion per year). And if it is invested with an investment rate of 10% per year it will obtain additional endowment fund of Rp 8 billion per month (100 billion per year). A fund can not be said to be small when compared with profit of 145 national banks which amounted to Rp 9.26 trillion (Infobank, July 2006) the acquisition or realization of income tax in 2005 amounted to Rp57 trillion (www.bwi.or.id).

If you look at the level of generosity of the people of Indonesia as described above, then it becomes something that is not impossible can happen. Moreover, based on the last survey conducted by PIRAC (Public Interest Research and Advocacy Center) in 2004, it turns out rate of giving the people of Indonesia
is still quite high. Based on these survey results rate of giving the people of Indonesia is 96% done for individuals, 84% (Rp 304,000 per donor per year) for a religious institution and 77% for non-religious institutions.

Calculations carried out by Mustafa Nasution (2001) revealed that cash waqf Muslims in Indonesia at this time is assumed to reach 3 trillion annually; and it could even be much greater. This is because the scope of the giver target cash waqf (wakif) can be very broad compared with regular waqf. Certificates of cash waqf, which is based on rules BWI at least 1 million, can be paid in installments or can be made in a variety of denominations that are tailored to target Muslim segment which approximately has a high awareness of the charity. For example, Rp.10,000,00, Rp 25,000, Rp 50,000, Rp 100,000, Rp 500 000, Rp 1,000. 000, 00, Rp 2,000,000.

**Economic Empowerment of People in the Perspective of Islamic Economics**

Empowerment is the language, from the Indonesian derived from the word "power" which means strength, which is the term means: Efforts to build a power possessed by d| uafa to encourage, motivate, and raise awareness about their potential and try to develop (Esack, 2000).

In al-Qur "an says power is referred to as" al-Quwwah ", in different variants, called 33 times (Thematic Interpretation, 2000). In Arabic it is called "al-Quwwah", in English called "empower" which, according to Cornell University Empowerment Group in Saleebey cited by Malik (2012) Empowerment is: "A process of deliberate and continues over time, which was centered in the life local communities, include: mutual respect, an attitude of critical reflection, the awareness and participation of the group, through which people who feel they have less joint valuable resources into obtaining greater access to get and control of these resources".

Economic empowerment of Muslims is very important for
several reasons: The first is due to the threat of God against the liars religion. In the interpretation of the letter al-Ma 'un described Allah says: "Do you (people) who reject religion. That's the guy who rebuked orphans and does not recommend giving Eat poor people. So woe to those who pray. (They are) those who are neglectful of their prayers" (Q.S.al-Ma'un: 1-5).

Said feed by M. Quraish Shihab (2002) every person who encourages or gives not feel that he has been feeding people in need. From asbab an-Nuzul it shows that criticism can be directed to anyone even if they provide assistance, meaning that if the aid is not well targeted to people who really need help and assistance, such as the reluctant help of orphans due orphans will not give up hope anything.

The second is for the hope of God's promise to those who assist or empower others. "Parable (income incurred by) those who spend their wealth in the way of Allah is like a seed that grows seven ears, in every ear a hundred grains. God magnifies (reward) for whom He will, Allah is the area (his gift) again Knowledgeable, ie those who spend their wealth in Allah's way, then they do not accompany what dinafkabkannya with menyebutnyebut grant and with not hurt (feelings of the recipient), their reward is their Lord. no fear come upon them and not (also) they grieve." (Q.S. Al-Baqarah: 261-262).

Muslims yearn for the glory and prosperity as was the case at the time of Caliph Umar ibn 'Abd al' Aziz. r.a. Caliphs were justly famous, when he was caliph only thirty months, at that time everyone who has a debt can get assistance from the typical state, all the basic needs are met, after all the basic needs are met, he provides assistance to small farmers to manage their land well , by providing credit from typical State. This policy is already several hundred years before the world knew of banks lending to agriculture.

Before the time of Umar ibn Abd "Aziz during the time of Umar bin Khattab at that time no one is willing to accept charity. Thus welfare under the auspices of Islamic justice to the extent that all have the right to obtain them (Qaradawi, 2002).
In conclusion, that the obligations and guidance of religion established by God, do not have any other purpose than for the benefit of mankind. God wants harmonious relations among all His creatures, in order to achieve happiness in this world and hereafter.

3. METHODOLOGY

This paper use descriptive qualitative approach. The type of data used in this paper is secondary data, generally in the form of evidence, records, or historical reports that have been compiled in the archive (documentary data), both published and unpublished (Moeloeng, 2004).

The technique used to collect the data in this paper are: (1) Study of literature, a series of activities related to data collection methods literature, reading and recording and processing of materials research; (2) Documentary, documentation Studies done by reading the previous writing reports and articles that are accessible from the Internet, books and journals that fit the problem. In this method the authors only transfer relevant data from a source or document required; (3) The discussion, which is the data collected by the talks and exchange ideas with people who are competent with the object that is being studied in order to solve a particular problem; (4) Intuitive-Subjective, is the involvement of the authors' opinion on the issue at hand. (Ghofar, 1999).

4. RESULT AND DISCUSSION

Concept Sharia Traditional Market Area

Sharia Traditional Market Area is the concept of revitalization of traditional market-based economic empowerment by the people who built and developed through the use of endowment funds. In the process, all forms of operations using the principles of Islamic Shari'a and social economy is to achieve the welfare of the world and the hereafter kaffah. Construction and development of the traditional market area is a strategic move to create endowment funds to be more productive and make a significant contribution
to the welfare of the people. Sharia Traditional Market Area is a solution to community empowerment effective and productive. Sharia Traditional Market Area has been built, will be managed professionally and in accordance with the values of shari'ah 'ah. Traditional Market Area Sharia will not only contribute significantly to community empowerment. But also can play a role childbirth featured merchants based on the values of sharia applicative program launched by the manager of Sharia Traditional Market Area.

**Forms of Economic Empowerment of People in the Revitalization of Traditional Markets Perspective Based on Sharia**

Under the conditions of the existence of traditional markets for populist economics is needed synergy across sectors that help significantly in revitalizing traditional markets. The economic empowerment of the people would aim to accommodate the role of government, academia and practitioners, and of course the traditional market players (in this case the involvement of traders and consumers) to assess further events to produce a recommendation of action to be implemented by the traditional traders in accordance perspective sharia. Research in this case is the scientific tools needed to address the problems that often arise which sometimes exacerbate the existence of traditional markets.

The concept of economic empowerment of the people in the traditional market revitalization aims to support the optimization of the value of participation among elements of organizing economic activity in a sustainable approach. Participation and cooperation is very important, because it can overlap the weaknesses that exist for this.
In order to achieve the objectives of the concept of economic empowerment of the people in the revitalization of this, it is necessary synergy between stakeholders who have a role each strategic. This synergy function to avoid overlap between stakeholders and allow for the dynamics. As for The Stakeholders involved in this program are:

- **BWI (Badan Wakaf Indonesia)**, which has a role as a collector and distributor endowment funds from the public whether in the form of cash and non-cash waqf as a capital in the implementation of this program. For that BWI should also perform important study of productive Waqf that will be used. In addition BWI also plays a role in the socialization of the productive Waqf to the public so as to create awareness and growth of productive knowledge of the management of waqf.

- **Academics and Practitioners**. Through the experience and capabilities in related disciplines, both parties to collaborate and run two, namely, (1) Research And Development of the concept of the traditional market includes the development of technology, product innovation, system or management and product differentiation. (2) Human Resource Development is the development of human resources through the development of both hard skills are reflected in managerial and scientific
concept of development as well as soft as reflected in the ability of the management of emotions in organizational management related institutions in the traditional markets.

- The government, which includes the role of government (both central and especially regional) in terms of stimulating the program which includes (1) Regulation role, in the form of policy-making and the protection and enforcement of laws related to this program are the support and commitment of the government, such as the control of competition business, environmental control and others. (2) Allocation role, in the form of distribution of scarce resources in this matter experts, support infrastructure, capital support, technology transfer and other inputs.

- The community particularly market traders who are members of various groups of merchants that act as the subject of economic empowerment of the people, especially the supporting performance of the application of this concept in the revitalization of traditional markets through an active role in participating. In addition it also takes the role of influential public figures as mediation in the institutionalization of the community to create social capital thus improving the efficiency of the implementation of the coordinated program regularly.

The application of the concept of economic empowerment of the people in the traditional market revitalization is divided into several stages, namely:

- Community Net Analysis, is to do a comprehensive analysis that comes from the traditional market players is the first step to determine the factors that affect traditional markets in the upstream to the downstream sector. This issue will be examined in accordance with the competence of each party, but at the same goal orientation by involving the larger traditional market traders.

- Then stakeholders do Mapping (mapping) deep and also formulate a solution and do Stratification of dividing the job description based on the role and capabilities of the problems.
that may be encountered by traditional market players either already, is happening or will happen, so it will not cause a shock in excessive the traditional market traders in case of a problem identical.

- Furthermore, through the development of a sense of belonging (ownership transfer) between stakeholders as a tool for understanding the social, cultural, and economic activity, to realize the ease in understanding the reality of the problem and the traditional market conditions and its ability to improve and compete with modern markets. The move is also aimed at realizing the institutionalization of the community to build relationships based on social capital, so that the relationship can be equal and mutually supportive. This is important, because the traditional market players (traders and consumers) are the main actors who will run the program. Normatively, all stakeholders sit together and perform together in a symbiotic mutualism to do research, learn to understand the problem and solve the problem together (participatory).

- Next will be a solution to problems through strategic movement (strategic planning) to solve the problem in the traditional markets. Then, arrangement of systematic steps, determine the stakeholders and formulate likelihood of success and failure of a planned program to address the issue of the internal market.

- Once the problem is completed or minimized, then the next step is to revitalize based strategic planning that has been made. The revitalization process not only focused on physical dimensions such as the improvement of infrastructure already fragile market or unfit but also social revitalization concerning the empowerment of traders in traditional markets. The concept of revitalization that carried the authors include four kinds as shown in the table below, namely:
Table 3. Konsep Revitalisasi Pasar Tradisional dalam Sharia Traditional Market Area

<table>
<thead>
<tr>
<th>No</th>
<th>Explanation</th>
<th>Indicator</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research and Development</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 1 | The rejuvenation of the values of sharia-based research and development to produce new goods or services or enhance existing traditional markets based on the active role of traditional market traders. | • Traders were able to identify the problems that arise in their environment  
• Traders were able to determine the objectives to be achieved regarding the problems identified based on Islamic principles  
• Traders are able to determine the steps both preventive and repressive in the realization of the purpose of the settlement of the problem based on Islamic principles  
• Traders are able to produce a real output in the form of models, modules, approaches, methods or media are used as a reference in performing activities in the traditional market in the future based on Islamic principles | • Development of a prototype models of products or services based on Islamic principles  
• Formulation of methodological suggestions for designing and evaluating the prototype based on Islamic principles  
• Data Bank on RnD that has been done as a benchmark study in the form of documentation |
| Human Resources Development | | | |
| 2 | The rejuvenation of the traditional market traders service capabilities through the development of | • Merchants have the ability or expertise and knowledge in management of financial, differentiation, distribution and marketing mechanisms and consumer services based on Islamic principles  
• Traders are able to apply strategic thinking, effective | • Traders are professional in developing products based on Islamic principles  
• Traders who understand financial management, credit, |
<table>
<thead>
<tr>
<th>No</th>
<th>Explanation</th>
<th>Indicator</th>
<th>Output</th>
</tr>
</thead>
</table>
|    | skills in financial management, product, distribution, and marketing-oriented mechanism on efficiency and customer satisfaction based on Islamic principles | management of change, and Business knowledge in management of financial, differentiation, distribution and marketing mechanisms and consumer services based on Islamic principles  
• Traders are able to put themselves appropriately to the situation and conditions in the face of the consumer or customer conditions based on Islamic principles  
• Traders are able to provide optimum service to approach or appropriate customer preferences based on Islamic principles | and recording based on Islamic principles  
• Traders are professional in providing services based on Islamic principles  
• Satisfaction and loyalty |
| Fisik | Realignment of spatial market through the development of infrastructure and the provision of supporting institutions such as safety, cleanliness, and financial cooperatives, and consumer complaints. | Traditional markets providing adequate facilities and infrastructure such as ATMs, a cooperative effort merchant, consumer services, places of worship, daycare and entertainment  
• Traditional markets into a clean and hygienic in waste management, provision of bins, air vents smoking area, and toilet  
• Traditional markets capable container provides the accurate information about price or events that occur  
• Traditional markets have a clear layout berdasarkankluster the goods or services are sold neatly | Traditional markets secure, convenient, clean, and orderly as a means of shopping  
• Traditional markets have a storage container to the supply / supply products  
• An integrated Islamic finance in the form of a cooperative effort of sharia or BMT trader  
• Information Center |
<table>
<thead>
<tr>
<th>No</th>
<th>Explanation</th>
<th>Indicator</th>
<th>Output</th>
</tr>
</thead>
</table>
| 4  | Setup process to establish new norms and values to become part of one of the social institutions in traditional markets. Once known, recognized and appreciated by the public, the new values and norms will be obeyed and kept the people in everyday life. | • Traditional Market participants understand and perform well and the maximum will be his roles as actors behave and interact on a traditional market activities based on Islamic principles  
• Traditional markets have values and norms which bind to achieve the objectives of the traditional market based on Islamic principles  
• Traditional markets have functional unit legal / formal form of institutional devices that function actively and participatory based on Islamic principles | • Legal or written rules on the activities in the market are accompanied by sanctions based on Islamic principles  
• Unit or institutions running and ensure the rules that apply sharia  
• Hieraki the organizational structure of the traditional market |
After efforts to revitalize the four proposed concept materialized authors then carried to the next stage, namely Social Response Continuous Process. In this step the traditional market traders and the relevant stakeholders are able to work together to find opportunities to contribute for the sake of preservation and enhancement of traditional markets in the Sharia Traditional Market Area. In this context, efforts to revitalize the paradigm shift. If in the past more on an ad hoc approach, charity, and it is now more driven externally and internally driven by stressing the importance of partnership.

**Figure 2. Continuous Social Response Process**

In this process there are several components of mapping to be done by the traditional traders in maintaining and improving the traditional markets that have been built. These components are:

1. **Periodic Meetings.** In each period a meeting conducted among traditional market traders assisted by governments, academics, practitioners and community representatives as consumer representatives to discuss problems, determine agreements and strategic planning undertaken next year.
2. **Strategic Planning.** Strategic planning is obtained based on the regular meetings. Strategic planning includes the vision-mission traditional market, legal agreements and local traditional markets, as well as market management division of duties include organizational, financial rules,
fees, taxes and rent, procurement of equipment and the formulation of a traditional market partnership with relevant stakeholders based on Islamic principles.

3. Experiences Provider, namely the means or tools to give or provide the consumer experience appropriate strategic planning that has been made. Based on the statement of Schmitt in Andreani (2006) experiential providers include: (1) Communication: advertising, public relations, newsletters, brochures, annual reports and megalogs; (2) Visual identity; Merck and logo market; (3) Product presence: product design, packaging, fresh product, and look distinctively services market; (4) Co-ing: event marketing, alliances and partnerships, and licensing; (5) Environment: interior design and characterize a unique market including the design of the response in response to the cultural, religious, or other major holidays; (6) Website tardisional market and other electronic media; (7) People: sales, sellers appearance, and the figure is seeded.

4. The service consumer, which means to load the aspirations and means of the active role of consumers on provider experiences provided in the traditional markets.

5. Data Management. Every trader must file all the aspirations of consumers who shop at traditional markets. It is intended to make archiving for further learning.

6. Problem Solving. The results of the data collected to formulate managed seeds of a strategy to solve the problems. This strategy delivered in accordance creativity traditional merchants, but must not conflict with the strategic planning that has been made.

5. CONCLUSION

Sharia Traditional Market Area is the concept of revitalization of traditional market-based economic empowerment by the people who built and developed through the utilization of funds very large endowments reached Rp 3 trillion per year. The concept of
economic empowerment of the people in the traditional market revitalization through Sharia Traditional market a solution that is realized through the synergy role of BWI, academics and practitioners, governments and communities, especially traditional market traders. This is realized through the stages in the form of community net analysis, mapping, stratification, transfer ownership, problem solving and revitalization. Once that is done by the social response continuous process. The application of this concept through the synergy of stakeholders will certainly produce an increase in the independent existence of traditional markets and sustained by principles sharia.

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Cash Waqf Financing
A New Scheme To Support Economic Growth

Rubaiyat Ahsan Bhuiyan

Abstract
Poverty is the central problem to sustainable human development. While this study reviews empirical evidence on the common findings from the existing literature on Grameen Bank and Islami Bank microcredit performance in Bangladesh. In general, most of the findings from the literature have shown that Islami Bank microcredit borrowers are doing well to reduce their vulnerability and poverty as well as improved socioeconomic status after access credit. Experience suggests that social welfare projects sponsored by most of the NGOs in Bangladesh and elsewhere in Muslim countries tend to create a built-in dependency. Once the support of the NGOs are withdrawn or the flow of aid stops for one reasons or another, this project cease to exist or make its beneficiary worse off in the sense that discontinuation of support push them back beyond their original level of living. This study also identifies some problems Islamic MFIs face in obtaining funds from external sources. Though some funds are available from government agencies, they impose certain terms and conditions. Some of these terms and conditions are contrary to Islamic principles and limit the flexibility in the operations of Islamic MFIs. Since commercial banks are increasingly adopting
stricter credit evaluation standards in giving loans to micro-entrepreneurs. This study propose the use of ‘cash waqf’ as an alternative and an additional source of capital for microfinance to promote the growth of Islamic microfinance in Muslim countries in general.

**Keywords:** Islamic finance, waqf, micro enterprise.
**JEL Classification:** G18, G21, G28

### 1. INTRODUCTION

Poor and poverty is the ancient history of human civilization. As the world around us is becoming progressively globalized but still record of poverty and its alleviation does not show remarkable progress where half of total population are living under poverty line in the world. Microfinance was come as the name of revolutionary approaches with the accessibility of the poor to credit without assets for collateral, enough financial records and credit history to increase their productivity in the self-employed economic activities for reducing vulnerability and poverty. According to Yunus and Abed, microfinance is an effective tool to alleviate poverty. The success of several microfinance programmes around the world, such as Grameen Bank in Bangladesh, Bank Rakyat Indonesia in Indonesia, Amanah Ikhtiar Malaysia in Malaysia, CARD in the Philippines, FINCA and ACCION in Latin America, and other microfinance institutions all over the world.

According to CGAP (2008) 72% of people living in Muslim majority countries do not use formal financial services. Even when financial services are accessible some Muslims view conventional banking products as incompatible with Islamic principles and laws (Sharia law). Some microfinance institutions (MFI) have stepped in to service poor Muslim clients who demand financial products in accordance with Islamic financial principles leading to the development of Islamic microfinance as a new market niche. Recognizing that microfinance can be an important channel in poverty alleviation, Islamic microfinance is
increasingly seen, especially in Muslim majority countries, as an alternative to conventional microfinance to alleviate the poor out of poverty. Islamic MFIs have been developed with the sole purpose of providing the poor which have little or no access to capital from the commercial banking sector with viable financial services that are in accordance with Islamic principles. Zarqa (1988) points out that there are various institutions and structures that Islam has instilled to redistribute income and wealth for the fulfilment of the basic needs for all in the society. The institutions include, among others, zakah, waqf and qard hasan. Siddiqi (2004) asserts that the ingenuity of the Islamic financial sector would be to integrate the vision of a moral society and socially responsible finance into functioning institutions. In line with this assertion, this paper studies the prospects of a waqf-based poverty-focused microfinance institution.

Suggestions of establishing waqf-based financing institutions serving the poor have been made by various scholars. Cizakca (2004) suggests a model in which the concept of cash waqf can be used in contemporary times to serve the social objectives in the society. One use of cash waqf would be to provide microfinance to the poor. Similarly, Elgari (2004) proposes establishing a nonprofit financial intermediary, the qard hassan bank that gives interest free loan (qard hassan) to finance consumer lending for the poor. The capital of the bank would come from monetary (cash) waqf donated by wealthy Muslims. Kahf (2004) and Ahmed (2003) propose establishing a microfinance institutions based on zakah, awqaf, and sadaqat. They suggest that the returns from awqaf and funds from sadaqat can be used to finance productive microenterprises at subsidized rates. In addition, zakah can be given out to the poor for consumption purposes to avoid diversion of funds from productive heads. This paper studies the economics of micro-financing and discusses the sustainability and operational issues of a waqf-based MFI in details. To do so, I first outline the features of the conventional MFIs and critically examine their strengths and weaknesses. Drawing on the strengths of conventional MFIs, an alternative of Islamic micro-financing based of waqf is then outlined.
2. LITERATURES

Microcredit System Of Grameen Bank In Bangladesh

Bangladesh is the home of microcredit and it has been started by Dr. Mohammad Yunus in 1970s; through as an action project in Jobra village in the district of Chittagong, Bangladesh (Jolis, 1996). At present there are more than three thousands active Microfinance Institutions (MFIs) are working for move out poverty. Microcredit is a very effective instrument to empower the poor (especially to women). It is cost-effective and sustainable, creates self-employment for the most poor and opportunity to move out of poverty, builds on trust and mutual co-operation, dedicates to establish credit as a human right, and the poor do not have to come to the bank but the bank goes to the poor. Grassroots organizational development is an integral part of GB’s credit program which helps in building up viable grassroots units in the form of groups and centers to promote strong group solidarity.

Structure of Grameen Bank

The Board of Directors of GB consists of 13 members of whom 9 are elected from among the borrower shareholders and the rest 4 are appointed by the government of Bangladesh. This board approves bank policies and serves as the link between the bank, the Ministry of Finance, and other government organizations. Various activities of the bank are organized and implemented by four tiers of administrative set-up such as branch office, area office, zonal office and head office.

The branch offices are the lowest operation units of GB which are located in the villages. One branch serves a cluster of 120–150 centers and it has a manager, six or seven workers, two to three trainee workers and an accountant. The branch offices select and organize the target clientele, supervise credit operations, and recommend sanction of loans. An area office
supervises about 10 to 15 branch offices which are assisted by program officers. The area manager works under the supervision of the zonal office that is located in the district headquarter which is at the top of the hierarchy at the field level.

A zonal manager supervises about 8 to 10 area offices. The zonal manager is responsible for handling accounts, managing funds, and monitoring, evaluating and supervising the social development programmes. The head office of GB is situated in the capital city Dhaka. It is responsible for monitoring and evaluation, research and development, supervision of training, and similar activities which are benefited from access to information from different operational areas. The Chief Executive of GB is the Managing Director. He is responsible for the overall implementation of the policies of GB and has to maintain close contact with various departmental heads in the head office and zonal managers to assist in formulation and change of policies.

The features of Grameen Bank are as follows (Hulme 2008):

a. Lend to poor rural women, as they were less likely than men to use loans badly and were more reliable for repayment.
b. Organize women into cells of five which took collective responsibility for each other’s loans.
c. Establish centers where six cells consists of 30 women met at a set time each week, to apply for loans and make repayments.
d. Charge a higher rate of interest than government schemes and NGO loans programmes.
e. Require clients to make compulsory micro savings each week and to make promises about their social conduct,

Simple, standardized products that required regular, small repayments, and recruiting and training bright, young graduates to administer services to minimize corruption.
Grameen Bank has started from one village in 1976 and at present it is covering to 68 thousand villages (all the villages of Bangladesh). It has provided services to 42 poorest borrowers in 1976. In 1983 GB had established as a bank with 36,000 borrowers and a portfolio of $3.1 million. In 1997 GB had a portfolio of $260 million and 2.3 million members, most of them were very poor, more than 90% of them were women, and all of them from rural areas. In December 1999 the branches of GB became about 1,149 which were operating in 39,706 villages with 67,691 centers. Also there were 2,357,083 members, of which 2,234,181 were female and 122,902 male (Grameen Bank 1999).

The first disbursement was Tk.856 ($27) and in 2006, it covers 6.23 million borrowers through 2,121 branches of whom 96.52% are women and the cumulative disbursement is Tk.276.54 billion ($5.52 billion). The recovery rate of the bank is 98.55%. The outstanding amount is Tk.31.13 billion ($444.39 million) and the balance of deposits is Tk.35.49 billion ($506.66 million) (Barua 2006). By the end of February 2008 GB had 7.4 million clients and outstanding loans of $545 million (Hulme 2008).

**Working System of Grameen Bank**

Five new members form a group and 5 to 8 groups form a centre, and all members in the centre meet with a loan officer weekly and members must sit in straight rows, salute, chant, and sometimes perform exercises (Hashemi 1997). The chant related to praise small families, prohibit dowry and child marriage, promote gardens, admire education, and encourage members to drink clean water and to use sanitary latrines. Each borrower has learned to sign their names, and memorize a set of vows to self-improvement and save $0.02 a week. A group can have only one person from any particular household and relatives must not be in the same group. Groups have either male or female members but not both. Each group elects a chair, and each centre elects a chief. New members must also buy a share of stock in GB for 100 taka ($1= Tk.48.5 in December 1998).
The group members select a chairperson and a secretary, and these positions rotate cyclically among the members on a yearly basis so that all members can learn the responsibility of these positions. The chairperson’s work is to maintain discipline in the group and for supervision of loan utilization by the members. All members in the centre meet with a loan officer weekly.

The group chairpersons elect the chief and the deputy chief of the centre for a one-year term. They are required to ensure attendance at the general meetings, payment of instalments, and overall discipline of the centre members. The members promise to repay but some break their promises. If any member fails to repay the loan then other members of the group must pay the amount of the defaulter and the group is banish if they fail to repay the full loan at the end of the year and will not find loan in future which is called joint liability by the GB rule.

The safe borrowers who repay the loan regularly have to subsidize risky borrowers of the group who are default. But the GB never safe a sincere borrower from a risky one and end of the week the GB officer takes repayment from the chairperson. Sometimes the chairperson has to pay full repayment. If the subsidize rates are sufficiently high, safe borrowers are unlikely to apply for a loan, because they face heavy loss by taking loan from GB.

Joint liability at GB is more subtle than the popular perception and more complex than the theory. But Rai and Sjöström (2001) show that joint liability is not enough to efficiently induce borrowers to help each other (discusses later). Such cross-reporting is used by the GB at village meetings where loan repayments are collected (Rahman 1999).

Most formal lenders require assets such as land, houses, or bank balances to avoid risks which also help to take loan in future. As a result most borrowers repay because they want to preserve their future access to loans (Schreiner 1999). To avoid risk GB applies techniques such as 2 members get loans first, if they pay the instalments regularly during the observation period of 6–8 weeks, 2 more members get loans one month later and after one more month, the last member, the chairperson receives a loan.
Loans have to repay within one year (Hashemi 1997). Loan sizes are modest, ranging from Tk.3,000 ($75) to Tk.10,000 ($250) and no collateral is required for a loan, and the borrowers invest the loan in the area of their choice. The group chairperson and bank workers monitor borrowers to see whether they are utilizing the money properly (Sarker 2001). Borrowers who have paid most of their debts have incentives to make sure that their peers also repay on time.

If the GB fails to collect the entire loan with interest within one year it may suspend all disbursement at a centre until all debts are up-to-date. Then the officers may also scold the women or detain them in the centre longer than normal which shames women and may subject them to the wrath of their husbands when they finally are released (Rahman 1999).

The new borrowers get very small loans and the amount increases gradually depending on creditworthiness. After returning previous loan GB offers bigger loans such as housing loans with bigger disbursements, longer terms, and lower interest rates. But housing loans provide women with legal rights to the land and the house (Islam et al. 1989). Later GB made a quantum leap to loans for education expenses and for cell phones (Zwingle 1998). GB provides loans to the poor women for buying Grameen mobile phone and women do business by offering mobile services in the rural areas that have not been linked to the nationwide telecommunication schemes, as so the poorest women are able to raise income and savings (Mair and Schoen 2007).

GB has four types of forced savings, where saving is compulsory and withdrawals are restricted but members can borrow against in emergencies and GB calls it emergency fund (Morduch 1999a, Khandker, Khalily and Khan 1995). The first two types are not really savings at all but rather fees which members will never get back. After taking their first loan each member must pay $0.01 each week to support schools (where members learn rules of loans and payments of GB) run by the centre. They must also pay 0.5% of disbursements in excess of
$20 into a fund used to cover losses from default. The last two types of forced savings are real savings. Members must deposit 4 cents each week into personal savings with interest 8.5%, and withdrawals are unrestricted. In addition, 5% of each disbursement goes to the group fund with same interest 8.5% and makes loans from the group fund after floods and other natural calamities. Members cannot withdraw their savings in the group fund until they leave GB or until they have ten years of membership. But a member can borrow from the group fund for consumption at times of sickness or social ceremony. GB manages the emergency fund for use as insurance against potential default because of death, disability, or other misfortunes. This fund is also used to provide life accident insurance to all groups’ members, repay bad debts, and undertake activities that improve the health, skills, education, and investment opportunities of group members.

GB wanted to change the social and economic structure of rural Bangladesh and it supplies loans and insurance, what it calls discipline (Montgomery 1996). The most important non-financial service of GB is social intermediation (Bennett 1998) where membership in GB gives women a socially accepted excuse to gather and to talk (Larance 1998). The impacts are both psychological and economic and not only women feel less isolated but also strengthen their support networks for when various troubles strike.

As the clientele GB are from the impoverished part of society, it intends to provide training on health and nourishment and creates consciousness among its borrowers regarding the tree plantations and clean environments. It offers seeds of vegetables and fruits to its borrowers and motivates the borrowers for making and developing a kitchen garden in order to increase the daily basis income of borrowers (Hossain et al. 2001).

GB realizes that besides income and production risk, lack of financial and social discipline is an important source of poverty. It encouraged planting trees, growing kitchen gardens, raising small families, and building houses and sanitary latrines. It
mobilizes the poor into groups for training and disseminating information about contraceptives, children’s education, health and nutrition, and other socioeconomic indicators of development. Its objective has become to empower women by enabling them to undertake independent income-earning activities (Khandker 1996). GB intervention has helped develop happy partnerships between husband and wife in terms of decision making regarding family affairs (Todd 1996). GB development programmes have given many women a sense of empowerment in the society.

4. RESULT AND DISCUSSION

Islamic Bank Microcredit in Bangladesh

As Islam is the complete guideline for all mankind in their whole parts of life. It has treated poverty is not only social evil but ideological evil also. It is the obligation of Allah to the rich to help the needy for its so much, so that the neglect of this obligation resembles denial of Islam itself. In such situation, Islami Bank Bangladesh Limited was founded with the major objective of establishing Islamic economy for balanced economic growth by ensuring reduction of rural-urban disparity and equitable distribution of income on the basis of Islamic rules and regulations. It is the largest private bank in the country (Ahmed, 2004; Alam, 2009; Hossain, 2005; IBBL, 2006; Mizanur Rahmana, 2008; Parveen, 2009). In according to the objectives of bank, it has been operated group based microcredit scheme known as ‘Rural Development Scheme (RDS)’ was launched in 1995 as a pilot program styled after the Grameen Bank model except that the scheme used Islamic modes of investment. The main goals of RDS to provide the financial access for creating opportunity of income generation of the rural people with a view to alleviate poverty (IBBL, 2006; Mizanur Rahmana, 2008).

The main objectives of RDS are:

- To extend investment facilities to agricultural, other farming and off-farming activities in the rural areas.
• To finance self-employment and income generating activities of the rural people, particularly the rural unemployed youths and the rural poor.
• To alleviate rural poverty through integrated rural development approach.
• To extend investment facilities for hand tube-wells and rural housing, keeping in view the needs of safe drinking water and housing facilities of the rural poor.
• To provide education and Medicare facilities to the down-trodden people.

Initially it has been started as a pilot operation in the rural areas of several districts under the direct supervision of the nearby Branches of the Bank. At present, it is extended to all the 61 districts out of 64 districts of the country through 139 Branches of the Bank. The metropolitan areas and three Chittagong Hill Districts are kept outside of RDS (IBBL, 2006).

It has been practiced Murabaha and Bai-muajjal modes of investment for financing the participants. Very recently, RDS has started practicing Musharaka mode as well. In all cases the Branch must ensure strict adherence to the banking and shariah in norms. For this investment, RDS charge only 10 per cent profit on flat rate with a rebate of 2.5 per cent for timely payment while, the conventional microcredit institutions charges 15 to 22 per cent interest for income generation which is much higher compared to traditional banks. The investment recovery rate of RDS is 99.57 percent (IBBL, 2009).

**The role of Islamic Microcredit on Socioeconomic Development in Bangladesh**

Habib et.el. have been done good study in 2003 to examine the effectiveness of RDS credit provided by the Islami Bank Bangladesh Limited through interviewing a few randomly selected program beneficiaries located in Sadar and Fulbaria Upazila of Mymensingh district. Most of the beneficiaries were observed to have required loan money within reasonable time limit during the
study period. Loan was found to have been productively used irrespective of loan holder categories. Loan repayment performance of the beneficiaries was observed to be satisfactory. Self-consciousness and hope of receiving future loan were observed to be the major contributing factors for good loan repayment behaviour of the beneficiaries. Small borrowers were good re-payers followed by the medium and large borrowers (Habib, 2003). Moreover, another study was undertaken to examine the effectiveness of RDS credit provided by the Islami Bank Bangladesh Limited through interviewing a few randomly selected program beneficiaries located in Sadar and Fulbaria Upazila of Mymensingh district. Most of the beneficiaries were observed to have required loan money within reasonable time limit during the study period. Loan was found to have been productively used irrespective of loan holder categories. Loan repayment performance of the beneficiaries was observed to be satisfactory. Self-consciousness and hope of receiving future loan were observed to be the major contributing factors for good loan repayment behaviour of the beneficiaries. Small borrowers were good re-payer’s followed by the medium and large borrowers (Habib, 2004). In the same time, another study has been asserted that Islamic banks are predisposed to provide microfinance in a "win-win" situation. In other words, Islamic banks can finance the poor at no extra cost.

Theoretical arguments presented show that Islamic banks can provide microfinance more efficiently benefiting from its scale of operations. To support some of the theoretical assertions, empirical evidence is given from the experience of Rural Development Scheme, a microfinance program of Islamic Bank Bangladesh Limited (Ahmed, 2004). Furthermore, Ahmed has found in his study’s that the success of a micro finance programme depends on its impact on raising the income of its members and ultimately on improving the living standard of the poor. However, Mannan in 2006 has been done an analytical review of an innovation in Islamic Micro-finance in terms of Family Empowerment Micro-Credit as operation by Social Investment Bank, Dhaka, Bangladesh in contrast to 20,000 or so
non-Governmental organization (NGOs) operating mainly in the country's 86,000 villages, providing micro-credit mainly to women. A country case study and comparative approach are adopted. It is demonstrated that Family Empowerment Micro-Credit program that ensures joint liability of husband and wife linking credit to culture works better than the approach adopted by NGOs in Bangladesh. Family empowerment micro-finance represents a paradigm shift in Islamic Finance. It is linked to culture based on convention and custom of a society. It is argued that the regulation and standardization of Islamic Microfinance operations in non-formal and non-corporate sector have to be “custom tailored” in the context of diverse Socio economic settings (Mannan, 2006). Another study has been assessed the potentials of Islamic financing schemes for micro financing purposes. They argued that Islamic finance has an important role for furthering socio-economic development of the poor and small (micro) entrepreneurs without charging interest (read: riba’). Furthermore, Islamic financing schemes have moral and ethical attributes that can effectively motivate micro entrepreneurs to thrive. In the other way M. Mizanur Rahmana found in 2008 that most of the clients have utilized their borrowed.

Money and increased household income and expenditure had increased significantly and clients had a positive opinion towards the micro investment program as it improved their standards of living but the reality is that not all the clients have invested their borrowed money in income generating activities. This study is an endeavour by the researcher to examine mainly the institutional, financial and economical sustainability of the above model by using various indicators. The empirical analysis of the study reveals that RDS of IBBL has been treated as a sustainable MFI in the rural development and poverty alleviation of Bangladesh with a short span of time of its establishment. While conventional microfinance products have been successful in Muslim majority countries, these products do not fulfil the needs of all Muslim clients.

The burning issues which hampers the growth of MFI:
Grameen Bank in Bangladesh intends to empower the women, as opposed to man (as over 95% of its client are women) and most of the other NGOs intend to empower the poor, as opposed to rich, they are heavily dependent on foreign loans, aids and grants and work on high interest rate basis of implicit assumptions of social class conflict. Experience suggests that social welfare projects sponsored by most of the NGOs in Bangladesh and elsewhere in Muslim countries tend to create a built-in dependency. Once the support of the NGOs are withdrawn or the flow of aid stops for one reasons or another, this project cease to exist or make its beneficiary worse off in the sense that discontinuation of support push them back beyond their original level of living. Here adjustment process is painful and tends to generate social stress, tension, alienation and protest. Eventually, this venerable groups turns into a class of alienated people, most likely to commit social crime in both rural and urban setting (Mannan, 2006).

The current definitions of microfinance in Malaysia, instead, include population segments that are not considered as poor to be eligible customers for microfinance products. The ‘real’ customers, i.e., the real poor, could be deprived from benefiting from the microfinance services if the current definition is applied, because a loan given to someone who is better off means that a poor person, in turn, would be deprived from having such a loan.(Norma)

Successful Islamic microfinance experiments in Muslim societies are small in number. Further, these institutions are not integrated into the formal financial systems, with the notable exception of Indonesia. Cases of Islamic banks practicing microfinance are even fewer. While these MFIs use various Islamic modes of financing on the assets side, they face certain problems on the liabilities side. A survey of Islamic MFIs in Bangladesh identifies lack of funds as one of the major constraints to growth and efficient operations (Ahmed 2002). The same survey identifies some problems Islamic MFIs face in obtaining funds from external sources. Though some funds are available from government agencies, they impose certain terms and
conditions. Some of these terms and conditions are contrary to Islamic principles and limit the flexibility in the operations of Islamic MFIs. For example, the funds are given on interest and the MFIs may be required to recover a certain fixed rate of return on their investments. As a result, funds from these sources cannot be employed in micro-financing with certain Islamic modes of financing like *mudarabah* and *musharakah*. Other than limiting the expansion of operations of MFIs, lack of funds has other detrimental implications. The MFIs cannot hire sufficient workers at competitive wages. Lack of funds also means employing fewer field level workers, lowering the employee-beneficiary ratio, adversely affecting supervision and monitoring. Paying lower wages also implies that they can employ relatively low productivity workers. Low pay sometimes induces employees with experience to move on to other MFIs paying better pay and benefits. These factors increase the probability of default and lowering the expected income of MFIs. The cost of fund invested in current Micro credit program is relatively high due to supervision cost (Mannan, 2006).

**Toward New Concepts and Applications of Microfinance**

During a period of crisis – such as the current global financial crisis – funds are diverted away from micro financing purposes in order to give loans to big corporations. The preference of banks and financial institutions to do business with big companies could mean that there will be fewer funds channelled for microfinance purposes. Since micro-entrepreneurs have to compete for credit from the commercial banks against the stronger big corporations and since commercial banks are increasingly adopting stricter credit evaluation standards in giving loans to micro-entrepreneurs, I propose the use of ‘cash *waqf*’ as an alternative and an additional source of capital for microfinance to promote the growth of Islamic microfinance in Muslim countries in general.

According to Amadou Cisse, the Vice President of the Islamic Development Bank, the amount of ‘cash *waqf*’, as well as that of *zakāt* funds throughout the Muslim world reaches hundreds of billions dollars a year, and the capacity for mobilising
these resources is huge. The institution of *waqf* is said to have originated as early as the time of the Prophet, but it reached particular significance during the Seljuk and Ottoman periods. It entails the use of cash, land, and real estate for charitable purposes.


There are certain conditions governing *waqf*, but the objective is to serve the poor and the community. The presence of *waqf* and charities on the liability side of IMFI’s is compatible with the social financial intermediation role of MFI’s – especially the creation of ‘cash *waqf*’ as a source of income for Islamic microfinance. Figure 2 shows how cash *waqfs* could be used as a source of funds for Islamic microfinance.

Cash *waqfs* can be sourced from potential donors who want to donate their money to help the poor to venture into income-generating activities. The sourcing of this fund can be done by an Islamic microfinance institution (IMFI) which will act as a trustee of this fund. The IMFI will then identify eligible beneficiaries of the cash *waqf* which will be the poor or needy micro-entrepreneurs.

**Financial Aspects of Waqf-based Islamic MFI**
The balance sheet of the proposed *waqf*-based Islamic MFI is given in Table 2. On the liability side, cash *waqf* ($W$) will constitute the capital of MFI. Along with the *waqf* endowment donated by the founders, additional *waqf*-funds can be generated by issuing *waqf* certificates ($S$). Other than the savings of the beneficiaries, the MFI can also attract deposits from the public by providing opportunities of *Shari’ah* compatible saving facilities ($D$). These deposits will take the form of *mudarabah* or profit-sharing contracts.

**Table : Balance sheet of a *Waqf*-based Islamic MFI**

<table>
<thead>
<tr>
<th>Asset</th>
<th>Liability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash ($C$)</td>
<td>Savings Deposits ($D$)</td>
</tr>
<tr>
<td>Assets ($A$)</td>
<td>$Qard hasan$ deposits ($Q$)</td>
</tr>
<tr>
<td>-Low-risk assets ($F$)</td>
<td><em>Waqf</em> Certificates ($S$)</td>
</tr>
<tr>
<td>-Microfinancing ($M$)</td>
<td><em>Takaful</em> reserves ($T$)</td>
</tr>
<tr>
<td>Loans- <em>Qard</em> ($Q$)</td>
<td>Profit Equalizing Reserves ($P$)</td>
</tr>
<tr>
<td>Investments ($I$) [murabahah, ijarah, salam, <em>Istisna</em>, <em>mudarabah</em>, <em>musharakah</em>]</td>
<td>Reserves/Economic Capital ($V$)</td>
</tr>
<tr>
<td></td>
<td>Capital-<em>waqf</em> ($W$)</td>
</tr>
</tbody>
</table>

MFIs need to create some special reserves to insure against the risks arising from negative shocks. The first type would be the *takaful* reserve ($T$) created by small weekly/monthly contributions of the beneficiaries. This *takaful* reserve would be used to support beneficiaries who are unable to pay their dues on time due to some unexpected problems like a natural calamity or death in the family. Second, a profit equalizing reserve ($P$) will be established by deducting a small percentage of the profit-share of depositors during the relatively profitable periods of operations. This reserve will be used to boost rates of returns on deposits during periods when the returns get depressed. Similarly, the MFI would build up a reserve ($V$) from its surplus that can serve as economic capital.

This reserve can be used to cushion any negative shock that may affect the financial position of the institution adversely. Other than cash ($C$), the assets of a *waqf*-based Islamic MFI will
comprise different types of non-interest bearing financial instruments.

Due to reasons discussed below, a waqf-based Islamic MFI will hold a combination of low-risk fixed-income assets \((F)\) along with micro-financing activities \((M)\). Micro-financing will include investments \((I)\) and qard \((Q)\).

For investments purposes, a variety of Islamic modes of financing may be used. The type of financing instrument will depend on the type of activity for which funds are granted. The economic activities that microenterprises usually engage in production, trading, and providing (transport) services.

Some of the appropriate Islamic modes of financing for these activities are pointed out below. The principles of Islamic financing can be broadly classified as partnerships \((sharikat)\) and exchange contracts \((mu’awadat)\). Various kinds of financing arrangements can be used to finance different kinds of activities. Musharakah principle can be adopted in production (agricultural and non-agricultural).

The Islamic MFI can provide part of the financial capital to produce an output and in return receive a share of the profit. In trading, the Islamic MFI and the client can jointly finance the purchase and selling of a certain good and distribute the profit. Production undertaken under mudarabah principle would imply that the Islamic MFI finances and the client manages the project. In agricultural production, output sharing can take the form of muzara’a.

The Islamic MFI may fund the purchase of irrigation equipment, fertilizers, etc., which the landowner uses on his land to cultivate a certain crop. The harvested crop is then shared by the landowner and the Islamic MFI at an agreed ratio. Other than profit-sharing principle discussed above, murabahah and ijarah forms of financing can also be used in production. For example, if

\[2\text{ Low-risk and risk-free are used to identify these class of assets would include either deposits in Islamic banks on placement in murabahah funds.}\]

\[3\text{ Detailed expositions of the different principles of Islamic financing are found in Kahf and Khan (1992) and Ahmad (1993).}\]
Given the small scale nature of the operations of the micro entrepreneurs, it may be difficult for the Islamic MFI to use either sale-based or partnership modes of financing. It is too costly (in terms of man-hours) and at times impossible to buy the goods/assets that beneficiaries want. For example, it becomes very difficult to accompany a beneficiary who may want a particular kind of good sold in a far off market. One way to overcome this is to use profit-sharing modes of financing. The sharing modes of financing, however, have their own problems. The main problem is the moral hazard problem arising from false underreporting of profit as it is very difficult to assess the financial accounts. This problem can be mitigated by supervising the operations and

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4 See Ahmed (2002) for a discussion on the responses from a field survey on problems of using Islamic modes of financing in micro-financing.
monitoring accounts of the beneficiaries. Supervision and monitoring, however, is costly.

In some special cases, the MFI can use loans (*qard*) that charge service costs only. These loans would be used for poorest sections of the population and for activities where other modes of financing cannot be used. The borrower of *qard al-ḥasan* is only required to repay the original amount of the loan. Scholars argue that the administrative fee or service charge for loan transactions is not against Islamic principles. The Islamic Development Bank in Jeddah, for instance, recovers a service charge of 2 per cent to 3 per cent on interest free loans. Therefore, if *qard al-ḥasan* is given by any financial institution, the imposition of a service charge or administrative fee would be permissible. In other circumstances, if microfinance is given for personal financing, Islamic MFI should extend credit based on *tawarruq*. With the context of an ‘Islamic transaction’, *al-tawarruq* means buying goods or assets in instalments and then selling them for cash at a lower price to a third party who is not the original seller of the commodity or asset.

**Sustainability of Waqf-based Islamic MFI**

We discuss the status of *waqf*-based Islamic MFIs with regard to the three fundamental problems related to operations and sustainability of financing microenterprises next.⁵

*Mitigating Credit Risk*

As mentioned above, the innovative operational format of MFIs suits the poor, whose lack of physical collateral disqualify them to borrow from traditional commercial banks. Waqf-based Islamic MFIs will retain the innovative format of operation of conventional MFIs and oriented the program towards Islamic principles and values. Thus, like their conventional counterparts,

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⁵ These conclusions are based on a survey on Islamic MFIs by Ahmed (2002).
Islamic MFIs have largely resolved the credit risks through social collateral of groups and weekly repayments.

**Resolving Moral Hazard Problem**

Islamic MFIs have some inherent characteristics that can resolve the moral hazard problem faced by conventional MFIs pointed above. The main mode of financing used by the Islamic MFIs is *murabahah/bai-muajjal* or *ijarah* (leasing). These instruments involve real transaction and instead of cash being given out, asset/good is exchanged. As a result, the opportunity of diverting funds for non-productive uses other than that requested for is reduced, if not eliminated. This increases the profitability of the MFI by decreasing the default rate.

In cases where Islamic MFIs get funds from traditional interest-based outlets, the financing costs appear to be high. For example, the financing costs of two small Islamic MFIs, Noble and Rescue in Bangladesh, were 35.8 percent and 12.5 percent of the total expenditures respectively (Ahmed 2002). As the bulk of the *waqf*-based Islamic MFIs funds will come from *waqf* endowment, the financing costs of these institutions will be significantly lower than their conventional counterparts. Given the philanthropic nature of these funds, no returns are expected by contributors. While Islamic MFIs will pay returns on funds coming from external sources like deposits and beneficiary savings, the *waqf* component of funds will significantly reduce the financial costs and improve financial viability of the institution.

The above discussion shows that by adopting the group based financing of the conventional MFIs, Islamic MFIs have resolved the problem of credit risk. Furthermore, the use of Islamic modes of financing linked to real transactions subsides the moral hazard problem by preventing diversion of funds for other purposes in Islamic MFIs. Furthermore, Islamic MFIs can tackle the economic viability problem by reducing their financing costs significantly.

**Other Approaches To Funding MFI Operations**
While the paper proposes the use of a waqf-based MFI to finance the poor, some other sources of funds can be used to further enhance the scope of Islamic microfinancing. Some of these sources are discussed below.

Along with waqf and qard Hassan

The institutions of zakah and sadaqat can be integrated into microfinancing program to effectively alleviate absolute poverty. These traditional instruments of social welfare can be used in financing the poor entrepreneurs. Integrating zakah into microfinancing can prevent fund diversions and benefit the poorest beneficiaries (Ahmed 2002). Zakah given to the poor can be used for consumption, asset building, and productive purposes to complement funds of Islamic MFIs. As these complementary funds will reduce the need for diverting money for consumption and/or purchase of assets, it is expected the funds taken for productive activities will be invested accordingly. As a result, the overall return on invested funds is expected to be higher and the probability of default lower. Thus, integrating Islamic institutions of zakah and charities with microfinancing will increase the probability of repayment of the funds to the Islamic MFI.

The scope of Islamic microfinancing can also be increased by getting Islamic banks involved.

Ahmed (2003) shows that Islamic banks are predisposed to provide microfinance in a "win-win" situation. It is argued that Islamic banks can provide microfinance at lower operating and financing costs. The operating costs of providing microfinance in case of Islamic banks will be much smaller than MFIs, and these institutions will provide microfinance from existing branches and not incur any extra fixed costs (rent, utilities, etc.). Furthermore, it will not require a whole range of professionals/employees, particularly at the top management level at the head office and regional offices. Similarly financing costs for Islamic banks is expected to be lower. Most Islamic banks have excess liquidity given the lack of Islamic compatible money-market instruments to
park funds for shorter periods of time. Given this excess liquidity, the opportunity cost of using these funds is almost zero. These funds can be used for micro financing as no extra cost. Thus, Islamic banks can finance microenterprises more efficiently (at a lower cost) than MFIs.

Additionally, Islamic banks can use income derived

From late-payment penalties and other proceeds which it cannot include in its income (like interest earnings from treasury operations). Islamic banks can create a *waqf* from these funds and use these for microfinance operations. As suggested in point 2 above, Islamic banks will be able to provide microfinancing at a lower cost than MFIs due to lower operating and financing costs.

5. CONCLUSION

Muslim countries tend to create a built-in dependency. Once the support of the NGOs are withdrawn or the flow of aid stops for one reasons or another, this make its beneficiary worse off in the sense that discontinuation of support push them back beyond their original level of living. Cases of Islamic banks practicing microfinance are even fewer. This crucial problem for Islamic MFIs faces in obtaining funds from external sources. Though some funds are available from government agencies, they impose certain terms and conditions. Some of these terms and conditions are contrary to Islamic principles and limit the flexibility in the operations of Islamic MFIs. These factors increase the probability of default and lowering the expected income of MFIs. The cost of fund invested in current Micro credit program is relatively high due to supervision cost.

Given these shortcomings, the article suggests the possibility of using cash-*waqf* as a new source of funding for Islamic microfinance and proposes new concepts and applications of Islamic microfinance, thereby putting it in line with the true Islamic spirit of microfinance. Furthermore, the article also proposes the use of other modes of financing such as muḍārabah,
murābaḥah, ijara, and muzara’a as well as qarḍ al-ḥasan and tawarruq in extending credit to the poor. With this new concept and application of Islamic microfinance, it will be able to further enhance the growth of microfinance to reach millions of poor Muslims, whether in Bangladesh, other Muslim countries, or among Muslim minorities in non-Muslim countries.

The paper also suggests some other sources of funds that Islamic MFIs can tap into to expand their operations. Other than using zakah and sadaqat as additional resources, Islamic banks can also provide micro-financing efficiently without cutting into their profits. As Islamic modes of financing involve transfer of real assets/goods, use of these instruments by these institutions can lessen the problem of diversion of funds to non-productive. Furthermore, using waqf to finance MFI operations can reduce the financing costs and improve the viability of these institutions.

In addition, with this new concept and application of Islamic microfinance, we are convinced that the use of microfinance would genuinely cater for the needs of the poor and the needy and as a means to combat poverty as well as generating socio-economic growth in the Muslim world.

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Islamic Financing

Risk And Return Simulation of Islamic Financing
Withstand to Economic Shocks: A Case Study in Indonesia

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Abstract
In pursuit of supporting the implementation of national development, Shariah banking often faced with stability problems of financing instruments being operated. In this case, it is measured by the gap between the actual rate of return (RoR) and the expected rate of return. The individual actual rate of return of this instrument will generate an expected rate of return. This raises the gap or difference between the actual rate of return and the expected rate of return of individual instruments, which in this case is called the abnormal rate of return.

The stability of abnormal rate of return of individual instruments is certainly influenced by the stability of the expected rate of return. Expected rate of return has a volatility or fluctuation levels for each financing instrument, as well as a key element or material basis for the establishment of an individual
variance instruments. Variance in this case indicate the level of uncertainty of the rate of return. Individual variance is the origin of the instrument base for variance in the portfolio finance that further a portfolio analysis.

This paper is going to analyze the level of expected RoR volatility as an initial step to see and predict the stability of the fluctuations in the rate of return of Indonesian Islamic financing instruments. Islamic banking ability to survive of the economic crisis in 1998 is sufficient to provide evidence that it can play a role in maintaining the stability of the financial system in Indonesia. This was absolutely influenced by the various types of financing contracts that Islamic banks offer to their customers. Therefore, this study aims to determine the best portfolios simulation of Islamic financing that can maintain the stability withstand to economic shocks.

In this study, the return and variance of equivalent rate of return of Islamic banking from 2004 to 2014 in Indonesia were computed using modeling volatility GARCH (Generalized Autoregressive Conditional Heteroscedasticity) in order to obtain the portfolio risks. The types of portfolio financing selected from this simulation can play an important role in maintaining the stability of their low volatility during global and national economic shocks.

*Keywords: Return, Portfolio risk, Volatility, Economic Shock*

*JEL Classification: C12, C13, C22, C32, C50*

### 1. INTRODUCTION

Islamic banking efforts for diversifying the financing product to become portfolio of financing is very important to improve the return or refund for Islamic banks, so that the growth of Islamic banking in Indonesia has increased and the share of Islamic banking assets are no longer to be far below conventional banks. But that is an obstacle in the business establishment of this portfolio financing is the need to examine the behavior of the
return of each islamic financing instruments, namely how the expectations of return of each instrument before between one instrument combined with other instruments. Whether expected rate of return of each these forms of financing that shows the behavior/characteristics that tend to be stable or fluctuating.

Financing return is not the only obstacle in this case, but also the risk which is a measure of the uncertainty of the expected rate of return to be earned in the future of the portfolio financing. Islamic banking will certainly avoid the high risk of finance in contracting the finance portfolio to investors. Not stop here only because it is also important to consider the level of fluctuations (volatility) of the gap between the actual rate of return and the expected rate of return of Islamic financing instruments, considering the monthly time series data in the financial sector or financial (rate of return) very high level of volatility. This gap is called the abnormal rate of return. The high volatility is characterized by a phase in which the fluctuation is relatively high and then followed a low fluctuation and high back, in other words, the data is averaged and variants are not constant. Thus, the volatility of the abnormal rate of return of Islamic financing instruments is also a measure of uncertainty as additional consideration to establish the financing portfolio in this study to look at the volatility of the expected rate of return as the element.

The economic crisis in 1998 which was very powerful had caused many banks in Indonesia got financial difficulties and some of them even went bankrupt. But Islamic banks were proven to be resilient to the economic shocks. Absolutely, the existence of Islamic financing instruments would be one that plays major role in saving Islamic banks from various risks due to economic shocks.

The existence of Islamic financing instruments must not be separated from the possibility of uncertainty of risk and return that arise. Furthermore, to minimize risk and increase returns, Islamic banks can diversify their earning assets into a portfolio of financings. It is very important for Islamic banks to have a good
portfolio of financings in order to ensure they can deliver competitive rates of return to their investors along with the lowest possible risk. In order to form a good portfolio of financings, it is important to examine the behavior of each Islamic financing instrument that forms the portfolio especially the expected rate of return of each instrument when it is combined with other instruments.

However, it is important to remember that Islamic banks should not only concern on the rate of return but also the risk of the portfolio. The risk of a portfolio is the uncertainty of the expected rate of return to be earned in the future of the financing portfolio. Islamic banks will certainly avoid the high risk of financings to be included in their portfolios. Therefore, it is very important to look at the behavior of risk of each financing instrument when it is combined with other Islamic financing instruments in a portfolio to ensure the combination of those instruments create optimum results. In other words, the combination must minimize the risk not increase the risk. In addition, it is also important to consider the level of fluctuations (volatility) of the portfolio risk of Islamic financing instruments. This is because in practice, the monthly time series data of Islamic banks' rate of return is very volatile.

Given the importance of risk, risk volatility and rate of return, this study tries to analyze the behavior of portfolios risk and return of Islamic banking financings. Furthermore, this study also calculates the volatility of the portfolio risk of Islamic banks in Indonesia. In this study, various combinations of Islamic financing instruments of Islamic banks in Indonesia are formed for the simulation and the risk-return behaviour is analyzed in order to the reaction of the ideal portfolio to the economic shocks during 2004-2014.

By this, the problems raised in this research is how to make the risk-return simulation of Islamic financing to withstand the economic shocks that matter as long as 2004-2014 period.
The results of this study are expected to help Islamic banks in Indonesia in evaluating, assessing, and planning funding and financing products strategies that have good prospect for the future and improving financing instruments which have bad risk-return behaviour and have high levels of portfolio risks volatility. With that, hopefully it will stimulate the growth of Islamic banks in Indonesia and make it survive over economic shocks. This study is not only for Indonesia, but also it can be applied for western and middle east country.

2. LITERATURES

Ismal (2010) attempted to determine the most efficient portfolio frontier of financial instruments of Islamic banks in Indonesia by analyzing the risk and return of each Islamic banks' possible portfolios. Return on Assets (ROA) for each financing instrument was used as a proxy to the equivalent rate of return/profit sharing from financing instruments of Islamic banks in Indonesia. The data in the form of financing instruments like mushakarah, mudaraba, murabaha and, istsina from 2001-2007 was collected and analyzed. Taking into account the findings of the individual and overall performance of the portfolio, efficient portfolio frontier curve explained that the Indonesian Islamic banking can optimize financing portfolio by not only focusing on the distribution of funds in murabaha but also in mudaraba.

Engle (2001) found that the kind of GARCH model can be used as a technique to construct an equation that measures the volatility (foresee or predict the variance) of the stock return and portfolio. Savickas (2003) also found that the kind of GARCH model is the best model that can capture the volatility effect of stock return data, compared to other methods such as the method of mean rank and standardized cross-sectional.

Alberto (2005) also found that the kind of GARCH method is better estimated in return of a stock than the OLS estimates. Alessandro (2007) also found that the kind of GARCH model, both the mean and variance models used to predict the return and risk over several periods ahead. Based on consideration
of forecasting the portfolio return and risk, it will be considered which one for the best portfolio.

Based on the previous studies above, it is found that the best method to conduct this study is the GARCH model. The next section elaborates in more details this method.

3. METHODOLOGY

3.1 Data Collection and Research Method

This study uses secondary data measured time series. Islamic Banks in Indonesia used as the sample in this study are categorized into Islamic Commercial Bank (BUS), Islamic Business Unit of a Conventional Bank (UUS) and Islamic Rural Bank (BPRS). The data was collected from Bank Indonesia particularly the monthly Islamic Banking Statistics (SPS) which is available on the website of Bank Indonesia and the Financial Services Authority (OJK). Time period of this study is from 2004 until 2014. The software used in this study is a Microsoft Office Excel 2007 and Eviews 6.0.

There are five types of financing instruments of Islamic banking used in this study, namely murabaha, mudaraba, musharaka, istishna and qardh. These are types of financings based on contracts offered by Islamic banks in Indonesia to their customers (Bank Indonesia, 2004-2013). This study uses a quantitative approach. As the previous studies, the econometric analysis conducted to support the analysis of return and risk and detect the volatility of portfolio rate of returns is ARCH/GARCH (p, q) models.

Risk-return portfolio theory is used to analyze the rate of return of each instrument, the expected rate of return, probability of occurrence and market share. Moreover, the risk-return portfolio theory also detects each risk financing instruments through the variation of the actual level and the expected rate of return. The expected rate of return of one and more than one financial instruments is defined as follows:
\[ E(R_i) = \sum_{i=1}^{N} p_i r_i \]  

\[ E(R_p) = w_1 E(R_1) + w_2 E(R_2) + w_3 E(R_3) + \ldots + w_n E(R_n) \]  

(>1 instrument) 

Where \( p_i \) is probability of occurrence of rate of return, and \( r_i \) is rate of return (RoR) instrument. Because Islamic finance theory states that future profits should not be ascertained, then this calculation uses historical data as a predictor (good predictor-proxy) for the probability of occurrence \( (p_i) \) above. For more than one instruments, then each instrument will be weighted \( (w_n) \) derived from the market value as written in equation 2 above. This method will provide proportionate treatment for all financial instruments are analyzed.

Then the difference between the expected rate of return and the actual value describes the variation (variance) instrument \( (\sigma) \) with the general formula equation 3 below. High variance showed no consistency (inconsistency) the movement of return on a particular indicative target (expected RoR) which among other things means that a relatively high risk of uncertainty (risk financing) a financing instrument during the period of the observations made. Variance of the instrument is shown by equation 4.

\[ Var(R_p) = \sum_{i=1}^{n} \sum_{j=1}^{n} w_i w_j \sigma_{i,j} \]  

(3) 

\[ Var(R_i) = \sum_{i=1}^{1} \sum_{j=1}^{1} w_i w_j \sigma_{i,j} \]  

\[ = p_i [r_i - E(R_i)]^2 + \ldots \]  

\[ = \sum_{i=1}^{N} p_n [(r_n - E(R_i))^2] \]  

(4)
\[
\text{Var}(R_2) = \sum_{i=1}^{2} \sum_{j=1}^{2} w_j \sigma_{i,j}^2 \\
= w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + 2w_1w_2 \text{Cov}(r_1, r_2) \\
\]

\[
\text{Var}(R_3) = \sum_{i=1}^{3} \sum_{j=1}^{3} w_j \sigma_{i,j}^2 \\
= w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + w_3^2 \sigma_3^2 + 2w_1w_2 \text{Cov}(r_1, r_2) \\
+ 2w_1w_3 \text{Cov}(r_1, r_3) + 2w_2w_3 \text{Cov}(r_2, r_3) \\
\]

\[
\text{Var}(R_4) = \sum_{i=1}^{4} \sum_{j=1}^{4} w_j \sigma_{i,j}^2 \\
= w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + w_3^2 \sigma_3^2 + w_4^2 \sigma_4^2 + 2w_1w_2 \text{Cov}(r_1, r_2) \\
+ 2w_1w_3 \text{Cov}(r_1, r_3) + 2w_1w_4 \text{Cov}(r_1, r_4) \\
+ 2w_2w_3 \text{Cov}(r_2, r_3) + 2w_2w_4 \text{Cov}(r_2, r_4) \\
+ 2w_3w_4 \text{Cov}(r_3, r_4) \\
\]

\[
\text{Var}(R_5) = \sum_{i=1}^{5} \sum_{j=1}^{5} w_j \sigma_{i,j}^2 \\
= w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + w_3^2 \sigma_3^2 + w_4^2 \sigma_4^2 + w_5^2 \sigma_5^2 \\
+ 2w_1w_2 \text{Cov}(r_1, r_2) + 2w_1w_3 \text{Cov}(r_1, r_3) \\
+ 2w_1w_4 \text{Cov}(r_1, r_4) + 2w_1w_5 \text{Cov}(r_1, r_5) \\
+ 2w_2w_3 \text{Cov}(r_2, r_3) + 2w_2w_4 \text{Cov}(r_2, r_4) \\
+ 2w_2w_5 \text{Cov}(r_2, r_5) + 2w_3w_4 \text{Cov}(r_3, r_4) \\
+ 2w_3w_5 \text{Cov}(r_3, r_5) + 2w_4w_5 \text{Cov}(r_4, r_5) \\
\]

While the variance between the two instruments as derived in equation (5) shows that in addition determined by individual variance, the weight of each instrument and the correlation value between them also determine the level of uncertainty (variance) financing result. The same also applies to the combination of the three instruments and the entire instrument (equation 6-8).

For overall financing, as well as the interpretation of variance single instrument, a low variance portfolio indicates that the combination of low-risk financing portfolio although there maybe individual high-risk instruments. Therefore, evaluation of individual instruments and portfolio is very important to produce
the ideal combination of portfolio (robust portfolio) low-risk but yield a high rate of return. To measure the degree of correlation between the instruments used coefficient of correlation ($\rho$), or with the formula below.

$$\rho = \frac{Cov(r_1, r_2)}{\sigma_1 \sigma_2}$$  \hspace{2cm} (9)

Econometric analysis using time series data in this case is to obtain the data series portfolio rate of return volatility of financial instruments of Islamic banking in Indonesia, through modeling ARCH / GARCH. The steps are described in more details in the following subsections.

**Stationarity Test Data through the Unit Root Test**

The first step that must be done in the estimation of the economic model with time series data is to test the stationarity in the data or also called a stationary stochastic process. Stationarity test data can be performed by using the Phillips-Perron test at the same level (level or different) to obtain a stationary data.

**Box-Jenkis Method (ARIMA)**

Box-Jenkins model is one of the techniques of data time series forecasting models based only on the observed behavior of variable data. This model is technically known as a model autoregressi integrated moving average (ARIMA). The main reason for the use of this model movements in economic variables studied such as the movement of exchange rates, stock prices, returns, inflation is often difficult to explain by economic theories. The Box-Jenkins models terdirir of several models: autoregressive (AR), moving average (MA), autoregressive-moving average (ARMA) and autoregressive integrated moving average (ARIMA).

**Autoregressive Model**

AR model shows the predicted value of the dependent variable $y_t$ is only a linear function of the number of actual $y_t$ earlier. For autoregressive models of order p, observation $y_t$ is formed from
the weighted average of past observations, p periods back and deviation of the current period. For example, the value of the variable \( Y_t \) is only influenced by the value of the variable or inaction of the previous period, the first such models called autoregressive model of the first level or abbreviated AR (1). AR model equation (1) can be written as follows:

\[
y_t = \phi_1 y_{t-1} + \delta + e_t
\]

(10)

where: \( y_{t-1} \) = first lag of dependent.

In general, the form of a general model of autoregressive (AR) can be expressed in the following equation:

\[
y_t = \phi_1 y_{t-1} + \phi_2 y_{t-2} + ... + \phi_p y_{t-p} + \delta + e_t
\]

(11)

Residual in equation (11) is as OLS model has the characteristics of an average value of zero, constant variance and not interconnected. AR model thus shows that the predicted value of the \( y_t \) dependent variable is only a linear function of the number of actual \( y_t \) previous.

**ARCH and GARCH Model**

Time series data, especially the data in financial sector, has a high degree of volatility. Volatility measures the average fluctuations of time series data, but it is developed further with the emphasis on the value of variation (statistical variables that describe how far the changes and fluctuations in the value distribution of the average value) of financial data. That is, the value of volatility as the value of the variance of the fluctuations (return data).

The presence of high volatility is certainly difficult for researchers to make estimates and predictions of the movement of these variables. High volatility shown by a phase in which the fluctuation is relatively high and then followed a low fluctuation and high return. In other words, the data is averaged and the variance is not constant. Sometimes a variant of error does not depend on the independent variable, but these variants change with the change of time. Application of financial data with the
characteristics usually on modeling the return of capital markets, inflation and interest rates. Thus volatility patterns indicate heteroscedasticity because there are variants error whose magnitude depends on the volatility of the error in the past.

Autoregressive Moving Average (ARMA) Model is often used in the modeling of time series data. This model has a stationarity assumption on the data and constant residual variance (homoscedasticity). This assumption is not easily fulfilled on time series data financially. The financial data has its own characteristics compared to the time series data in general, which shows high volatility following the period of time that shows volatility, variance for a long period of time the data is constant but there are some periods where the data variance is relatively high. This is called conditionally heteroskedastic. If detected, the conditionally heteroskedastic autoregressive moving average models (ARMA) no longer appropriate to use. The data get heteroscedasticity properties like this can be modeled by Autoregressive Conditional Heteroscedasticity (ARCH) which was introduced by Robert Engle.

ARCH method is a refinement of the ARMA method. At ARMA, the variance is not the center of attention when one uses the model is that we want to see a large deviation in the forecast, which means also the contribution of predictor variables that we input into the model works. For that ARCH is required to see the pattern of residual variance, so that we can evaluate and improve the return forecasts that we make, because this method further support the existence of other predictor variables are unknown or are not included in the model. ARCH designed specifically to produce models and forecasting (forecast) due to the presence of conditionals variance.

There are several reasons underlying the establishment of ARCH models and forecast volatility; first, the need to analyze the risks of the assets that we have or the value of an option; second, forecasting confidence intervals are at different times, so to get the interval can be obtained from the model variance of the error; and
third, a more efficient estimator can be obtained if heteroskedastisitas can be handled first.

To explain how ARCH models formed, suppose we have the following linear regression model:

\[ y_t = b_0 + b_1 x_{1t} + b_2 x_{2t} + \epsilon_t \]  \hspace{1cm} (19)

\[ \sigma_t^2 = \alpha_0 + \alpha_1 \epsilon_{i-1}^2; \quad \sigma_t^2 = \text{var}(\epsilon_t) \]  \hspace{1cm} (20)

Note that \text{var}(\epsilon_t) described by two components; constant component: \( \alpha_0 \) and variable component: \( \alpha_1 \epsilon_{i-1}^2 \); that is called ARCH component. On this model, \( \epsilon_t \) heteroscedasticity, conditional in \( \epsilon_{i-1} \). By adding information "conditional" or "conditional" the estimator of \( b_0, b_1, \) and \( b_2 \) become more efficient.

ARCH model above, where \text{var}(\epsilon_t) depends only on the volatility of the last period, as in \( \sigma_t^2 = \alpha_0 + \alpha_1 \epsilon_{i-1}^2 \), that is called ARCH(1) model. While in general, when it \text{var}(\epsilon_t) depends on the volatility of the past few periods as \( \sigma_t^2 = \alpha_0 + \alpha_1 \epsilon_{i-1}^2 + \alpha_2 \epsilon_{i-2}^2 + \ldots + \alpha_p \epsilon_{i-p}^2 \) is called ARCH (p) model or written by:

\[ \sigma_t^2 = \alpha_0 + \sum_{i=1}^{p} \alpha_i \epsilon_{i-i}^2 \]  \hspace{1cm} (21)

In this model, in order to be a positive variance (\( \text{var}(\epsilon^2) > 0 \)), then the restriction must be made, namely: \( \alpha_0 > 0 \) dan \( 0 < \alpha_1 < 1 \)

Note the number of ARCH (p) above. With a relatively large number of p will result in the number of parameters to be estimated. The more parameters to be estimated can result in reduced precision of the estimator. To overcome these problems,
so that the estimated parameters are not too much, the \( \text{var}(e_t) \) can be used the following model:

\[
\sigma_i^2 = \alpha_0 + \alpha_1 e_{i-1}^2 + \lambda_1 \sigma_{i-1}^2
\]  

(22)

This model is called the GARCH (1,1) because \( \sigma_i^2 \) depend on \( e_{i-1}^2 \) and \( \sigma_{i-1}^2 \) each of which has a time lag. Similarly, ARCH models, in order to be a positive variance (\( \text{var}(e^2) > 0 \)), then on this model should also be made restrictions, namely: \( \alpha_0 > 0; \alpha_1 \) and \( \lambda_1 \geq 0; \) and \( \alpha_1 + \lambda_1 < 1 \).

As ARCH model, the GARCH model can also be estimated by Maximum Likelihood technique. In general, the \( \text{var}(e_t) \) can be represented by the form:

\[
\sigma_i^2 = \alpha_0 + \alpha_1 e_{i-1}^2 + ... + \alpha_p e_{i-p}^2 + \lambda_1 \sigma_{i-1}^2 + ... + \lambda_q \sigma_{i-q}^2
\]  

or written by:

\[
\sigma_i^2 = \alpha_0 + \sum_{i=1}^{p} \alpha_i e_{i-i}^2 + \sum_{i=1}^{q} \lambda_i \sigma_{i-i}^2
\]  

(23)

The Model above is called GARCH(p,q) model.

From the model above shows that the amount of \( \text{var}(e_t) \) in addition to allegedly depends on \( e^2 \) also depends on \( \sigma^2 \) the past.

At the time series data of finance of the ARCH/GARCH element or a form of autoregressive of residual quadratic phase which is characterized by high fluctuations and then followed a low fluctuation and high return.

The steps in determining the ARCH / GARCH model includes first, identification of the mean models, testing the conditional variance heterogeneity, estimation of the parameters of ARCH / GARCH model, model diagnosis, and selecting for the best model.
4. RESULT AND DISCUSSION

There are five types of financing instruments of Islamic banking used in this study, namely murabaha, mudaraba, musharaka, istishna and qardh. From the combination of these five instruments, 26 types of portfolios rate of return and risk can be established. It is also found that 11 of 26 combinations of portfolios have risk and rate of return's behavior that tend to be better than the others.

Expected Rate of Return (RoR) and Portfolio Risk Volatility

In this study, stationarity test was conducted on the variables of each financing portfolio risk instruments and each expected rate of return. The test showed that on the whole there is no unit root variables, so the data is stationary, it is shown that the value of prob* or p-value less than $\alpha = 5\%$ (accept $H_0$) which means it does not contain unit root. By this, that variable expected rate of return volatility of istishna, mudaraba, murabaha, musharaka and qardh financing instruments calculation to be performed. This kind of portfolio risk can be brought to the next test phase.

Volatility Calculation of Expected Rate of Return and Portfolio Risk Financing Instruments

Volatility measures the average fluctuations of time series data, but it is developed further with the emphasis on the value of variation (statistical variables that describe how far the changes and fluctuations in the value distribution of the average value) of financial data. That is, the value of volatility as the value of the variance of the fluctuations (return data). Calculations performed with the ARCH/GARCH model volatility. In this study, modeling ARCH/GARCH performed on Expected Rate of Return and Portfolio Risk variables that have high volatility characteristics. Portfolio Risk is the risk of the portfolio value of the selected financing instruments. In determining the model, ARCH/GARCH consists of two stages: determining the mean and variance models. High volatility shown by the presence of a
phase in which the fluctuations are relatively high and subsequently followed by a low fluctuation and high return.

![Graph](image)

**Figure 1** Expected RoR development of *istikha*, *mudaraba*, *murabaha*, *musharaka*, and *qardh* (%) 2004 - 2014

Expected rate of return istishna relatively higher than the mudaraba or murabaha. It also fits with some research suggesting that mudaraba positive effect on the profitability of Islamic banking in Indonesia.

**Mean of the Model**

Establishment of the model is done by determining the mean equation Autoregressive Moving Average (ARMA). Selection of the best equation is done by looking at the AIC and SC are the lowest and adjusted R\(^2\) values are large. Because the analysis of time series requires that the data should be stationary then the ARMA processing using the data at the level expected RoR. From the result of trial and error and which has a value of AIC and SC are the smallest and Adjusted R\(^2\) great value, obtained the following results for each financing portfolio risk instruments and expected rate of return chosen.
Table 3. The results of the best ARMA model (mean model) selected of financing portfolio risk instruments chosen

<table>
<thead>
<tr>
<th>Port. Risk</th>
<th>ARMA (p,r)</th>
<th>Mean Model Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk 1,2,4</td>
<td>ARMA (2,1)</td>
<td>Risk (1,2,4) = 3.16 - 0.16 Risk(1,2,4)_t-1 + 0.74 Risk(1,2,4)_t-2 + 0.99 e_t-1 + e_t</td>
</tr>
<tr>
<td>Risk 1,3,4</td>
<td>ARMA (0,2)</td>
<td>Risk (1,3,4) = 2.88 + 0.72 e_t-1 + 0.21 e_t-2 + e_t</td>
</tr>
<tr>
<td>Risk 1,4</td>
<td>ARMA (0,1)</td>
<td>Risk (1,4) = 3.566 + 0.472 e_t-1 + e_t</td>
</tr>
<tr>
<td>Risk 2,4</td>
<td>ARMA (2,1)</td>
<td>Risk (2,4) = 3.89 - 0.166 Risk(2,4)_t-1 + 0.715 Risk(2,4)_t-2 + 0.997 e_t-1 + e_t</td>
</tr>
<tr>
<td>Risk 3,4</td>
<td>ARMA (0,2)</td>
<td>Risk (3,4) = 3.307 + 0.918 e_t-1 + 0.312 e_t-2 + e_t</td>
</tr>
<tr>
<td>Risk 3,4,5</td>
<td>ARMA (1,2)</td>
<td>Risk (3,4,5) = 2.857 - 0.901 Risk(3,4,5)_t-1 + 1.958 e_t-1 + 0.959 e_t-2 + e_t</td>
</tr>
<tr>
<td>Risk 4,5</td>
<td>ARMA (0,2)</td>
<td>Risk (4,5) = 3.578 + 0.949 e_t-1 + 0.232 e_t-2 + e_t</td>
</tr>
</tbody>
</table>

Note: 1 = Murabahah; 3 = Musyarakah; 5 = Qardh; 2 = Mudharabah; and 4 = Istishna.

Table 4. Selection of the best ARMA models (mean models) of variables expected RoR financing instruments

<table>
<thead>
<tr>
<th>Expected rate of return</th>
<th>ARMA</th>
<th>AIC</th>
<th>SC</th>
<th>Adj R²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Istishna</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARMA(1,1)</td>
<td>3.3742</td>
<td>3.4435</td>
<td>0.7113</td>
<td></td>
</tr>
<tr>
<td>MA(1)</td>
<td>4.0362</td>
<td>4.0822</td>
<td>0.4597</td>
<td></td>
</tr>
<tr>
<td>MA(2)</td>
<td>4.3809</td>
<td>4.3878</td>
<td>0.5729</td>
<td></td>
</tr>
<tr>
<td><strong>Mudharabah</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AR(1)</td>
<td>2.7196</td>
<td>2.7658</td>
<td>0.6715</td>
<td></td>
</tr>
<tr>
<td>MA(1)</td>
<td>3.2591</td>
<td>3.3051</td>
<td>0.4461</td>
<td></td>
</tr>
<tr>
<td>MA(2)</td>
<td>3.0414</td>
<td>3.1104</td>
<td>0.5580</td>
<td></td>
</tr>
<tr>
<td><strong>Murabahah</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AR(1)</td>
<td>2.9547</td>
<td>3.0009</td>
<td>0.4043</td>
<td></td>
</tr>
<tr>
<td>MA(1)</td>
<td>3.1646</td>
<td>3.210</td>
<td>0.2596</td>
<td></td>
</tr>
<tr>
<td>MA(2)</td>
<td>3.0573</td>
<td>3.1263</td>
<td>0.3403</td>
<td></td>
</tr>
<tr>
<td><strong>Musyarakah</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AR(1)</td>
<td>2.2354</td>
<td>2.2816</td>
<td>0.5659</td>
<td></td>
</tr>
<tr>
<td><strong>Qardh</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AR(1)</td>
<td>0.4209</td>
<td>0.4671</td>
<td>0.3778</td>
<td></td>
</tr>
<tr>
<td>AR(2)</td>
<td>0.3497</td>
<td>0.4193</td>
<td>0.4102</td>
<td></td>
</tr>
<tr>
<td>ARMA(2,2)</td>
<td>0.2098</td>
<td>0.3259</td>
<td>0.4954</td>
<td></td>
</tr>
</tbody>
</table>
Detection ARCH-error

After a mean model was formed, the detection of the presence of ARCH-error is done on the model. In this study, the detection of the presence or absence of ARCH-error is using the ARCH-LM test.

Table 5. ARCH-error detection results of the ARMA (p,q) model financing portfolio risk instruments chosen

<table>
<thead>
<tr>
<th>Risk of Financing Portfolio</th>
<th>Obs*R-squared</th>
<th>Prob.Chi-Square(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk 1,2,4</td>
<td>5.287423</td>
<td>0.0215</td>
</tr>
<tr>
<td>Risk 1,3,4</td>
<td>4.554439</td>
<td>0.0328</td>
</tr>
<tr>
<td>Risk 1,4</td>
<td>4.419516</td>
<td>0.0355</td>
</tr>
<tr>
<td>Risk 2,4</td>
<td>7.844086</td>
<td>0.0051</td>
</tr>
<tr>
<td>Risk 3,4</td>
<td>12.29789</td>
<td>0.0005</td>
</tr>
<tr>
<td>Risk 3,4,5</td>
<td>27.03698</td>
<td>0.0000</td>
</tr>
<tr>
<td>Risk 4,5</td>
<td>10.81092</td>
<td>0.0010</td>
</tr>
</tbody>
</table>

ARCH-LM test results for ARMA equation of financing portfolio risk instruments. ARMA equation shows that the portfolio variables showed statistically obs * R-squared with smaller probability than \( \alpha = 5\% \). Thus the hypothesis Ho is rejected, which states that there are elements of ARCH. Because eleven variables of the mean model of financing portfolio risk selected above, the error is generated contains elements that can be formed ARCH variance models.

The expected variable ARMA RoR murabaha, Musharaka and qardh statistics show obs * R-squared with smaller probability than \( \alpha = 5\% \), while the expected variable RoR istishna and mudaraba statistics show obs * R-squared with smaller probability than \( \alpha = 10\% \). Thus the hypothesis Ho is rejected, which states that there are elements of ARCH. Because of the mean models five variables above, the resulting error contains elements that can be formed ARCH variance models.
Variance Model

As in the process of establishing the model mean, variance formation step models are also through a process of trial and error. However, it should be followed by testing the normality of the residual model of ARCH / GARCH that will be selected. Test results showed that all models of ARCH / GARCH have no normal distribution of residuals. It is marked with a p-value or probability of the Jarque-Bera that less than 5% significance level, so that $H_0$ is rejected, stating that the residuals do not follow a normal distribution. To overcome this, the corrected standard errors in the subsequent estimation using the Bollerslev-Wooldridge correction (Bollerslev-Wooldridge robust standard errors and covariance) of the estimated quasi-maximum likelihood (QML) were performed. This is because although the residual abnormal, resulting estimation of maximum quasi-likelihood estimation (QML) remained consistent. So, the results of the estimated parameters remain valid even if not asymptotically normally distributed. Then proceed to test the significance of parameters. The final step in the determination of the variance model is to look at the value of the smallest AIC and SC, as well as the largest log likelihood.
Table 6. Selection of ARCH/GARCH Best Models (Variance Model) for financing portfolio risk instruments of variables selected

<table>
<thead>
<tr>
<th>Port. Risk</th>
<th>ARMA (p,r)</th>
<th>Variance Model Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk 1,2,4</td>
<td>GARCH (1,1)</td>
<td>$h_t = 0.0016 + 1.775 e_{2t-1} + 0.104 \sigma_{2t-1}$</td>
</tr>
<tr>
<td>Risk 1,3,4</td>
<td>GARCH (1,2)</td>
<td>$h_t = 0.00048 + 0.578 e_{2t-1} + 0.819 \sigma_{2t-1}$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$0.259 \sigma_{2t-2}$</td>
</tr>
<tr>
<td>Risk 1,4</td>
<td>GARCH (2,2)</td>
<td>$h_t = 0.00013 + 0.647 e_{2t-1} + 0.687 e_{2t-1}$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$0.212 \sigma_{2t-1} + 0.266 \sigma_{2t-2}$</td>
</tr>
<tr>
<td></td>
<td>GARCH (1,0)</td>
<td>$h_t = 0.0021 + 6.623 e_{2t-1}$</td>
</tr>
<tr>
<td></td>
<td>(2,1)</td>
<td>$1.043 \sigma_{2t-1}$</td>
</tr>
<tr>
<td>Risk 2,4</td>
<td>GARCH (1,2)</td>
<td>$h_t = 0.00038 - 0.055 e_{2t-1} + 1.62 \sigma_{2t-1}$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$-0.61 \sigma_{2t-2}$</td>
</tr>
<tr>
<td>Risk 3,4</td>
<td>GARCH (1,2)</td>
<td>$h_t = 0.0042 + 0.447 e_{2t-1} - 0.161 \sigma_{2t-1}$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$+0.614 \sigma_{2t-2}$</td>
</tr>
<tr>
<td>Risk 3,4,5</td>
<td>GARCH (1,1)</td>
<td>$h_t = 0.0016 + 1.775 e_{2t-1} + 0.104 \sigma_{2t-1}$</td>
</tr>
<tr>
<td>Risk 4,5</td>
<td>GARCH (1,2)</td>
<td>$h_t = 0.00048 + 0.578 e_{2t-1} + 0.819 \sigma_{2t-1}$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$0.259 \sigma_{2t-2}$</td>
</tr>
</tbody>
</table>

Note: $h_t = \sigma^2_t = \text{variance of squared residuals at } t\text{-month}; \ e^2_{t-p} = \text{squared residuals in } (t-p)\text{-month}; \text{ and } \sigma^2_{t-q} = \text{variance of squared residuals in } (t-q)\text{-month}$

Checking the Model

Testing can be done by using the autocorrelation correlogram, or a unit root test. Test results showed that all the statistics Q (Q-Stat) of expected RoR istishna and qardh financing instruments variable is not statistically significant, with probability (prob) over $\alpha = 5\%$. This means that the error does not contain the autocorrelation. For expected RoR mudaraba, murabaha, and musharaka financing instruments variable, there is still a significant Q statistics on some initial lag. However, after testing the unit root test stationarity, were error models are stationary at level I (0) (statistically significant at $\alpha = 5\%$). Therefore concluded that the error of the model does not contain the autocorrelation.

Terms good model is not contained in the residual element ARCH variance models and there is no autocorrelation in the error equation of ARCH / GARCH models. ARCH-LM test results for equation of ARCH / GARCH for financing portfolio...
risk instruments variable for the equation shows that the GARCH (p, q) of expected RoR istishna, mudaraba, murabaha, musharaka, and qardh variables and then the GARCH (p, q) eleventh variable portfolio risk statistics show obs * R-squared with probability greater than $\alpha = 5\%$. Thus the hypothesis Ho failed rejected stating there is no element of ARCH or not heteroscedasticity on the model.

**Overview The Volatility of Expected RoR and Portfolio Risk Selected**

*Volatility of Expected RoR*

Volatility of expected rate of return is a risk of instability or uncertainty of the expected rate of return financing instruments. ARCH/GARCH model volatility variable is used to form the expected rate of return based on the best model. To obtain the volatility of expected rate of return, first create the best ARIMA modeling each financing instrument as noted previously. Furthermore, the detection of whether the residual variance of the data expected RoR is not constant and varies from one period to another, or contain elements of heteroscedasticity. To detect this using ARCH-LM test. However, the residual variance not only depend on the residual period, but also depends on the residual variance ago period. So perform the modeling generalized autoregressive conditional heteroscedasticity (GARCH) as in the previous stage. From this is derived volatility GARCH of expected rate of return.

The movement of the volatility expected RoR can be seen in Figure 2 below. From this figure it is concluded that the expected RoR volatility of the financing instrument of mudharaba, murabaha, istishna tend to be more volatile than the expected RoR volatility of Musharaka and qardh financing instruments. This means that the expected RoR volatility of the musharaka and qardh financing instruments tend to be more stable than other instruments.
To make the Expected RoR more stable, we can create a risk simulation of the expected RoR forming some portfolio financing such as portfolio risk that has been tested previously. Of the portfolio will be seen how the portfolio financing currently facing economic crises or economic shocks. Next will be seen the most stable of portfolio financing to withstand in the face of economic shocks.

![Figure 2 Selected Expected Rate of return volatility movement of Islamic banking financing instrument in 2004 - 2014](image)

**Figure 2 Selected Expected Rate of return volatility movement of Islamic banking financing instrument in 2004 - 2014**

**Volatility of Portfolio Risk**

The volatility of portfolio risk is a risk of instability or uncertainty of the portfolio financing. ARCH/GARCH model volatility variable is used to form the portfolio risk based on the best model. To obtain the volatility of portfolio risk, first create the best ARIMA model for each financing instrument as noted previously. Furthermore, the detection of whether the residual variance of the expected RoR data is not constant and varies from one period to another, or contains elements of heteroscedasticity. To detect this, we can use ARCH-LM test. However, the residual variance does not only depend on the residual period, but also depends on the residual variance. So perform the modeling generalized
autoregressive conditional heteroscedasticity (GARCH) as in the previous stage. From this is derived GARCH portfolio risk volatility.

The movement of the portfolio risk volatility can be seen in Figure 3 below. From this figure is concluded that the volatility of the financing portfolio risk instruments of Risk (1,2,4); Risk (1,3,4); Risk (1,4); and Risk (2,4) tend to be more volatile than the volatility of Risk (3,4); Risk (3,4,5); and Risk (4,5). This means that the portfolio risk volatility of musharaka, istishna financing instruments (Risk (3,4)); musharaka, istishna, qardh (Risk (3,4,5)); and istishna, qardh (Risk (4,5)) tend to be more stable than other financing instruments. From the figure it is also seen that a significant fluctuation occurred in 2004-2005. Then over time, the three types of financing portfolios apparently show that the better risk behavior until today when seen from a stable trend over the period of time from 2006 to 2014.

Further interpretation can be seen from the shock at the beginning of 2010 of financing portfolio risk volatility performance in general, this happens because of the economic turmoil in 2008-2009. In that year there was an increase in fuel prices (fuel oil) in Indonesia, which also affect the prices of other goods and services. As a result, banks and customers expect that the rate of return also rose. In addition, the global crisis of 2008-2009 and the turbulence effects (shock) in the year in general to all types of financing portfolio risk, where the impact of the economic pressures are also being felt in 2010 that is characterized by the presence of turbulence (shock) . But it was not so influential on the three types financing portfolio risk that have a low level of volatility, the previous three portfolio risks that tends to be most stable. The three types of portfolio risk are musharaka, istishna (Risk (3,4)); musharaka, istishna, qardh (Risk (3,4,5)); and istishna, qardh (Risk (4,5)) appeared to have potential defenses that tend to be more powerful than any economic turmoils that arise.
The three types of portfolio risk are musharaka, istishna financing (Risk (3,4)); Musharaka, istishna, qardh (Risk (3,4,5)); and istishna, qardh (Risk (4,5)) only showed the significant presence of turmoils (shock) in 2004 and 2005. This occurred because of the devastating natural disasters in 2004 (tsunami Aceh), which became the center of attention at the time, as well as the increase in fuel prices (fuel oil) in 2005. But then the three type of financing portfolio risk remained at the level of risk volatility those have good stability.

The *mudharaba* financing instrument (risk 2) tend to increase the variance (risk of uncertainty) of financing portfolio in the event of a crisis. This is because of the financing is based on the real sector investment, so it tends to be sensitive to the economic sector. However it can be seen that the combination of istishna and musharaka financing instrument (risk 3.4) shows a very good risk behavior because the financing portfolio is likely to stabilize at a relatively lower risk. In 2008-2009 (global financial crisis) and entering in 2013 (starting of economic pressure), the portfolio financing risk in which a financing instrument combined with murabaha instrument (risk 1), causing the risk of financing portfolio has increased. This is because when the economy is depressed, interest rates will rise so that the cost of funds or funding needs will increase. And the same thing happened in Islamic banks, especially in financing instruments based selling. When interest rates rise, of course in Islamic banking customers expect that returns also increased so that banks charge to employers in order to return ride. And it should be emphasized here that the true in Islamic finance, the high risk offset by higher returns.

Furthermore, in 2007 began to increase due to economic pressures. The peak increase in financing portfolio risk uncertainty occurs when the global crisis period (2008-2009). And back up again ascending current economic pressures (in 2013). And the financing portfolio containing mudaraba financing instrument are very sensitive to any changes Indonesian economic conditions, due to the strong relationship between this instrument with the
real sector. This is because the financing is based on the real sector investment, so it tends to be sensitive to the economic sector. However, the financing portfolio consists of a combination of these mudaraba instrument not only has the level of high uncertainty/risk (varince), but also offset by higher expected rate of return which is a necessity in Islamic finance (Sharia-compliant). This also shows that financing based mudaraba (profit sharing) is indeed the spirit of Islamic banking.

The emergence of the global crisis in 2008 led to price stability and output did not ensure the stability of the financial system (annual BI Report 2010). However, from the results of the analysis of selected portfolio risk previously shown that there are types of financing portfolios that have the potential to survive in the event of economic turmoils.

By this, it can be concluded that the portfolio of musharaka, istishna (Risk (3,4)); musharaka, istishna, qardh (Risk (3,4,5)); and istishna, qardh financing instruments (Risk (4,5)) has strong potential in maintaining the stability of the financial system as potential financing portfolio that is able to absorb the shock that occur in order to prevent disruption to the real sector activities.

Financing portfolio instruments like musharaka, istishna (Risk (3,4)); musharaka, istishna, qardh (Risk (3,4,5)); and istishna, qardh (Risk (4,5)) again has a strong potential in terms of maintaining the stability of the financial system because of the potential for strong financing portfolio and resistant to a variety of economic disruption that is still able to spread the risk as well.

The strong potential of the portfolio financing instruments like musharaka, istishna (Risk (3,4)); musharaka, istishna, qardh (Risk (3,4,5)); and istishna, qardh (Risk (4,5)) in terms of risk management function properly.
5. CONCLUSION

Volatility measures the average fluctuations of time series data, but it is developed further with the emphasis on the value of variation (statistical variables that describe how far the changes and fluctuations in the value distribution of the average value) of the expected rate of return data. That is, the value of volatility as the value of the variance of the fluctuations. Calculations performed with the ARCH/GARCH model volatility. In this study, modeling ARCH/GARCH performed at the expected rate of return variable that has the characteristics of high volatility. Changes in the expected rate of return in this study is not only seen in value, but the volatility or the speed of the rise and fall expected rate of
return also observed. In determining the ARCH/GARCH model consists of two stages: determine the mean and variance models.

Expected RoR (Rate of Return) volatility of movement in this study it is concluded that the expected RoR volatility of mudharaba, murabaha and istishna financing instruments tend to be more volatile than expected RoR volatility of Musharaka and Qardh financing instruments. This means that abnormal RoR volatility of Musharaka and Qardh financing instruments tend to be more stable than other Islamic financing instruments.

Regardless of the factors that influence the volatility of the Islamic financing instruments, of course, this result gives an idea of how stable the five Islamic financing instruments to be developed as well as anticipated in developing Islamic banking in Indonesia, whether it will be used for the basic preparation of diversification product or financing portfolio serve as an opportunity to invest.

We can create a risk simulation of the expected RoR forming some portfolio financing such as portfolio risk that has been tested. Of the portfolio will be seen how the portfolio financing currently facing economic crises or economic shocks.

Based on this simulation study, the volatility of portfolio financing risk instruments of Risk (1,2,4); Risk (1,3,4); Risk (1,4); and Risk (2,4) tend to be more volatile than the volatility of Risk (3,4); Risk (3,4,5); and Risk (4,5). This means that the volatility of the portfolio risk of musharaka, istishna (Risk (3,4)); musharaka, istishna, qardh (Risk (3,4,5)); and istishna, qardh financing instruments (Risk (4,5)) tend to be more stable than other financial instruments.

Islamic banks' portfolio financing generally reacts significantly when the turmoil and economic pressures arise. But it was not so influential on financing portfolio risk of the three types of financing portfolios that have a low level of volatility. The three portfolio risk previous that tends to be the most stable. The three types of portfolio are musharaka, istishna (Risk (3,4)); musharaka,
istishna, qardh (Risk (3,4,5)); and istishna, qardh (Risk (4,5)) appeared to have potential defenses that tend to be more powerful than any economic turmoils that arise. The three types of financing portfolio remained at the level of good stability of risk volatility.

Financing portfolio like musharaka, istishna (Risk (3,4)); musharaka, istishna, qardh (Risk (3,4,5)); and istishna, qardh (Risk (4,5)) have strong potential in maintaining the financial system stability because the three portfolios are able to absorb the shocks that occur in order to prevent disruption to the real sector activities.

Regardless of the factors that influence the Islamic financing instruments volatility, of course, this result give an idea on how stable the Islamic financing instruments as well as the possibility of investment portfolio and anticipated to be developed in an effort to develop Islamic banking in Indonesia to be a potential stake in maintaining the financial system stability of the national, either would be used for a basic preparation of product diversification / financing portfolio or used as an opportunity for investment. This simulation study show that portfolio of Islamic financing in Indonesia withstand to economic shocks. And it can be applied for more countries like western and middle east.

REFERENCES


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