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A New Era of Monetary Policymaking in the Light of the Post-Crisis Challenges

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Abstract. Within appearing the global financial crisis, standard macroeconomic approaches, in particular, monetary policies conducted prior to global recession have become targets of harsh criticism because of their weakness against these imbalances. The recession was a consequence of multiple factors including excessive private and public debt, poor financial surveillance and incapability of institutional structure to cope with potential risk sources. However, due to the nature of the recession, monetary authorities have been accused much more because of uncertainties relating to their mandates, weakness of their precautionary signaling and also time-inconsistency problems of policy transmission channels.In addition, because of limited effects of both conventional and unconventional measures, the urgent need to revise mandates of monetary authorities and totally the nature of monetary policy is the topic attracting significant attention. In this context, reassessment of cardinalshifting in monetary policies and implementation of fundamental realignments to the conventional central banking conception can be noted as challenges of post-crisis period.
Keywords. Monetary policy, Central banking, Financial crisis, Unconventional measures, Financial stability.
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1. Introduction

The world is currently in the fragile recovery process after struggling with global crisis, which according to some economists, the worst economic crisis since the Great Depression. Within rapid expansion of globalization, high development levels in global economy, a radical decrease in unemployment levels in advanced and some emerging countries put the possibility of economic downturn under doubt. Because of these reasons, the global economic crisis that began in 2008 was largely unexpected and unforeseen for most scholars. Just before the crisis, the IMF in its bi-annual World Economic Outlook announced that risks to the global economy had become extremely low, given that capital inflows pushed up borrowing and asset prices, while reducing spreads on risky assets.

Within analyzing ultimate sources of sudden of the crisis, it becomes obvious that in order to lower the likelihood of future financial collapses, prudent economic policies as well as an adequate regulatory and supervisory framework for financial institutions are required. Global financial-economic crisis and its results make rethinking of macroeconomic policy framework necessity. (Blanchard et. al., 2010) Firstly, the Lehman crisis depicted limitations of monetary policy and how

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policymakers miscalculated the risks originating from financial system. Secondly, Eurozone crisis made it compulsory to revise the issues regarding with currency unions and monetary integration processes. Thirdly, poor regulatory and supervisory framework which contributed to high leverage and large maturity mismatch among financial system participants and institutions rather than countering externalities existing in the system, resulted with widespread counterparty mistrust, liquidity shortages, and contagion to other markets. This fact also depicts inadequacy of the financial system and key players' functionalities to the current financial architecture.

One of the key debates over rethinking macroeconomic policies closely relates to monetary policies and revising mandates of the authorities which are charged to implement these policies. Before the crisis economists and central bankers were in a celebratory mode, with talk about the "Great Moderation" and praise for advances in monetary economics that had helped stabilize the economy. (Goodfriend, 2007) However with the abrupt of the economic imbalances and monetary authorities' inadequacy to diminish their noxious effects on the economy, it became urgent demand for policymakers to realign monetary policy. Monetary authorities throughout the world preferred to respond to this demand by a mix of policy packages which encapsulated both cutting interest rates to historically low levels and embarking on a series of unconventional policy actions. (Peersman, 2011) The experience of central banks during the crisis reveals that these policies resulted changes in the composition of their balance sheets, measures that expand the size of the balance sheet or actions that try to guide longer term interest rate expectations.

It is not secret that many scholars consider that incumbent processes in the global economy relates to cyclical and structural transformation. Low interest rates which prevailed in the years prior to the global crisis are accepted as a key cyclical factor. According to Bernanke (2005), who called it "global saving glut", main reasons under low interest rates are both expansionary monetary policy reflected in short-term policy interest rates and capital inflows from emerging markets to developed countries that affected long-term interest. Prior to and after the crisis, the role and policy instruments that central banks should use in order to realize its targets are very debatable. For much of the period since 2008, many economies, including the US, the UK, Switzerland, Eurozone, and Japan, relied on the zero lower bound in order to achieve full employment, to target inflation and also to mitigate negative impacts of depressed aggregate demand and persistent gaps between output and potential. However these policies have not been fully successful in terms of achieving their targets while led to emerging vulnerabilities in financial markets. In the light of the crisis, it can be concluded that targeting of monetary policy should be directed not only to preserve price stability, but also financial stability. Moreover, creating reliable and effective macro-prudential policy framework also turned into key macro-level policy instrument which can ensure financial stability. (Smets, 2013)

The global crisis reflected excessive risk-taking and high leverage on the part of economic agents and financial institutions. Hence, to reduce the probability of another financial collapse, it is necessary to learn from experience by identifying the ultimate sources of the incentives that led to the crisis. (Sanchez, 2011) Based on this view, in the article it is tried to analyze briefly incumbent approaches to monetary policy which have been accepted as major sources of appearing the last crisis and assessing emerging paradigms in this field.

2. Cardinal Realignments in Central Banking

The post-crisis challenges of macroeconomic mainstream make central banks to shoulder the greater part of the burden of post-crisis adjustment. They are blamed as sinners of ignoring of global imbalances' emerging and speculative actions in financial markets. Therefore, the nature of monetary policies ought to be implemented by central banks as a response to economic fluctuations exposed to substantial controversial discussions. Standard new-Keynesian models (Goodfriend & King, 1997) dictate monetary policies should be formulated in a countercyclical way. Furthermore, these ones appreciate inflation stabilization measures adequate for preserving the welfare-relevant output gap declaring that inflation-output trade-off is not characteristic for monetary authorities in the process of realizing their targets like smoothing business cycles or enhancing long-term growth. This problem is entirely problematic in terms of incumbent global fragile growth patterns, liquidity trap threats and deflation pressures confronted by central banks. This led significant attention to the concept of "divine coincidence" which implies the idea that central banks ought to pay much attention to the stabilization of inflation when they face with dilemma between it and output. Proponents of this view consider that policies to keep inflation under control would also useful to stabilize output at potential level. Moreover, in the case of a severe recession, monetary policy effectiveness may be limited due to impairment of the monetary transmission mechanism so that central banks may more than ever be "pushing on a string". This reinforces the case for a conservative central bank that concerns itself only with inflation. (Rogoff, 1989) Moreover, in standard (conventional) monetary policy, capital markets are generally assumed to be efficient. Eventual financial imperfections and their potential macroeconomic effects are usually not taken into account when monetary policy is developed. (Weber, 2011) Temporary inefficiencies, such as asset price and housing price bubbles, are deemed events that monetary policy can do little to counteract. However, the crisis has caused a paradigm shift regarding the role of monetary policy in avoiding bubbles. Thus, monetary policy should avoid cheap credit if it enhances the artificial increase of prices for certain categories of assets. (Stark, 2010) Specifically, monetary policy should seek monetary equilibrium that does neither inhibit economic activity, nor potentiate inflation and artificially rising asset prices.

However, the recent global financial crisis made it urgent for economists to revise these approaches and confess the solution to get rid of current situation can be found beyond the scope of standard accounts of monetary policy theory. Firstly, relating to new-Keynesian approach, major central banks' attitudes (reducing interest rates to historical low levels, massive using of unconventional measures and etc.) towards economic imbalances, indicate that stabilizing inflation alone cannot be accepted sufficient to fulfill their targets. These policies were formulated targeting higher growth and inflation by lowering interest rates, prompting borrowing and expenditure, thus revitalizing economic activity. On the contrary, current global economic landscape is that households crippled by existing high levels of debt, low house prices, uncertain employment prospects and stagnant income are reducing, not increasing, borrowing. Secondly, the character of relation between financial sector and real economy has become more complicated. In case of normal downturns, easy monetary policy does lead to a stronger recovery in the case of normal downturns. However, in downturns associated with a financial crisis, particularly in the light of the latest one, statistically significant recovery has not been observed. (Bech et. al., 2012) Because of inability of pre-crisis monetary measures and approaches, a number of unconventional ones were introduced which made it completely unfeasible to maintain existing approach to central banking.

Prior to the global crisis, there was a common belief that central banks should focus only on financial variables' impact on inflation. Determined inflation targeting was considered enough in terms of provision macroeconomic stability. However these ideas are relied on the conclusions of the models which appreciated financial frictions as result of borrowers' activities in credit markets. In these models (Gilchrist & Leahy, 2002; Iacoviello, 2005; Bernanke & Gertler, 2000) credit-supply effects originated by financial intermediates are ignored. However, the global crisis made it obvious that how changes in credit supplies can be significant during macroeconomic fluctuations. According to empirical investigations, loose credit conditions led to augmentation of business cycles before the crisis. On one side, tightening of credit conditions after Lehman's bankruptcy contributed to drastic decrease in aggregate output in 2008-09 while on the other side, debt crises appeared in EU amplified credit crunch risk. All these imbalances made it necessity to revise influence of credit channel on monetary policy management.

Degradation of monetary policy instruments effectiveness can be appreciated as a crucial interference of the financial crisis which makes it necessity revise central banking paradigms. Some authors reckon that it is the suitable time to transform from "one policy, one tool" approach to the "more targets, more tools" view. (Blanchard et. al., 2013) In other words, not only pursuing policies to provide price stability (regulating inflation target through policy rates), but also supporting financial stability should be among central banks' targets. The outcomes of the crisis depicted that inflation or aggregate output stability is not sufficient to provide macroeconomic sustainability. Severity of the recession and limited effectiveness of policy instruments revealed shortcomings of financial market surveillance. In the early stages of the crisis, central banks responded imbalances by lowering interest rates to the zero bound levels drastically which deprived them from their major policy tool. From its initial period, the crisis indicated that classical multiple-equilibrium framework which offered a rationale to provide banks with deposit insurance and access to lender of last resort, currently begun to be applied also wholesale funding and non-bank intermediaries. Practically, countries are exposed to liquidity problem more than financial intermediaries because of the dependence on future tax revenues which are difficult to insure. Thereby central banks ought to supply liquidity not only for banks or other types of financial players, but also for states.

Based on Tinbergen rule which is often stated like "for each policy objective, at least one policy instrument is needed", central banks' stance during the last economic downturns is confusing. There are strict arguments which dictate that central banks have failed to detect the auspices of the crisis mainly because of their incapability to prevent these signs using their narrow "price stability" target. In the light of this view, some consider that monetary policy should be directed toward price stability, which is a central bank's best contribution not only to long-term economic growth, but also to financial stability. (Pally, 2011) Therefore, it is widely argued that the responsible for monetary policy should have a comprehensive and continuous overview of the macroeconomic conditions (the inflation rate, the production gap, the balance of payments, the public budget, the exchange rate, household debt, etc.). (Vale, 2014) Based on this overview, a central bank has the competency to takes its monetary policy decisions. This strategy requires (in addition to such a macroeconomic overview) flexibility (which can be obtained at the expense of transparency) and a discretionary approach to monetary policy. (Sauer, 2010) However, lack of central banks' strict regulatory and supervisory tools to target credit and housing bubbles that weakened the financial system have raised suspicions related to revising monetary authorities' mandate.

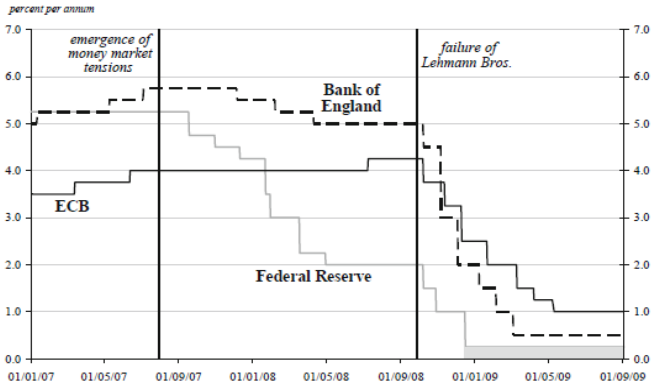
The experience indicates that discretionary approach can originate dynamic inconsistencies through damaging monetary authorities' credibility and efficiency of policies targeting to control inflation and interest rates misalignments. This argument is also strongly correlated with the fact that the forecasting models of the monetary authorities used widely prior to crisis did not incorporate crucial aspects of the financial sectors. Therefore, a rule based policy can be more credible, because it is more transparent and easier to anticipate for the actors in the market in accordance with Kydland & Prescott's (1977) famous "rules rather than discretion" state.

In the light of these shortcomings of central banks' mandates, their approach to financial imbalances also cast significant attitude. This problem has become much more considerable particularly in the context of monetary authorities' incapability to manage expectations and lagging processes in markets. Moreover, within introducing of concepts like rational expectations and time-inconsistency (Kydland & Prescott, 1977; Calvo, 1978; Barro & Gordon, 1983); the need to adjust monetary policy decisions to the conjectural realignments has become much more significant in terms of realizing long-run targets. Difference and incoherence between expectations and final outcomes of individuals and policymakers lead to failure of monetary policy strategies. In other words, without a commitment mechanism, monetary policy makers may find themselves unable to *consistently* follow an optimal plan over *time;* the optimal plan can be *time-inconsistent* and so will soon be abandoned. The notion of time-inconsistency has led to a number of important insights regarding central bank behavior-such as the importance of reputation and institutional design. In the phase of massive application of zero-bound level policies, time-inconsistency problem has contributed to increasing discussions about the nature of monetary policies also.

3. Central Banks' Responses to the Crisis: Unconventional Monetary Policies

In the current recovery processes in global economy, one of the issues which began to attract attention is wide spreading of mixture of unconventional monetary policies, fiscal consolidation & stimulation and macro-prudential policy tools in order to revive global demand. In particular, in the context of inadequacy of international financial institutions' intervention to the economic downturns, central banks preferred to implement accommodative monetary policies through various policy frameworks. During the crisis and sluggish growth years after it, major central banks have embarked on unconventional policies, to bring the real interest rate down further and thereby generate new investment demand. However, efficiency of these policies is very debatable. Aiming to solve insufficiency of demand, using monetary policy to drive the real interest rate permanently to low or perhaps, even negative rates is certainly difficult and can create significant distortions in the economy as seen in the example of some Eurozone countries. Countries could in principle achieve negative real rates through low nominal rates and moderate inflation however these are not enough to eliminate the risk of facing an adverse feedback loop, in which depressed demand leads to lower inflation, lower inflation leads to higher real rates, and higher real rates lead in turn to even more depressed demand. In the recovery process, a main challenge for advanced economies is efforts to normalize monetary policy. While some of this expected normalization has already been priced in both long rates and exchange rates, it can be expected complex and sometimes disruptive capital movements across countries for some time to come. In that environment, it can be predicted that emerging market economies with weak macro frameworks may be most affected.

The severity of depressions and conjectural realignments made central banks to refine their policy instruments and move from conventional monetary policy – reducing policy rates via open-market purchases of short-term government bonds – to a range of unconventional policies. Monetary authorities all over the world, including Fed, European Central Bank, Bank of Japan and other advanced central banks responded to crisis in its early stages through using their most powerful tool-interest rate channel. However, the experience of the crisis made it obvious that lower rates and increasing the supply of money can stabilize financial markets but are not sufficient enough to contribute a drastic boost to economic activity. In other words, in the light of absence demand, central banks failed to encourage new investment and recover economic activity through low interest rates. Lack of coordination in the policies of advanced economies' central banks can also be assessed as a major risk source not for only these countries, but also for emerging market economies. Consequently, monetary policies implemented in various advanced economies are seemed cannot hurdle major difficulties that these economies confront. In addition, global contradiction of fiscal-monetary policies-in most countries these policies are not supported with each other which it makes recovery processes fragile and pull global economy to secular stagnation. Conventional approach toward monetary policy which implies that lower interest rates will encourage households and companies to consume and invest more, therefore will positively affect other macroeconomic imbalances like inflation and output imbalances has become much more unrealistic in the case of the last crisis. Exactly, these monetary approaches by central banks and their policies' weakness to direct economic processes led to the emerging of phenomena which is generally known as Keynes's hypothesis on liquidity trap. Indeed, Keynesian liquidity trap arises at the point where the demand function for money becomes infinitely elastic, which could happen at a non-zero interest rate. The current situation in which the nominal rate hits its zero lower bound, has come to be called a "liquidity trap" (Krugman, 1998), although that terminology differs somewhat from Keynes' original meaning. Central banks aim both to stabilize inflation around a low level and to keep output close to its potential level. But monetary policy operates under considerable and unavoidable uncertainties about the state of the economy and the size and lag of the economy's response to monetary-policy actions. In the light of these uncertainties, conventional monetary policy measures implemented during prior to the crisis period, have been unable to provide sufficient stimulus to the economy and address recession and deflation once the zero lower bound for interest rates has been reached. However, these attempts are not enough to stimulate economic activity at the desired (and also predicted) level. As Blanchard (2013) mentioned, "On the liquidity trap: we have discovered, unfortunately at great cost, that the zero lower bound can indeed be binding, and be binding for a long time—five years at this point…it remains a fact that compared to conventional policy, the effects of unconventional monetary policy are very limited and uncertain". When unconventional monetary policies started to be implemented, many analysts were worried that the expansion of the monetary base would trigger inflationary pressures and central banks would lose control over price stability. However the reverse happened and currently monetary authorities are under deflationary pressures rather than opposite. This situation can be explained in two interpretations: either potential output has decreased close to actual output and therefore influences inflation weakly; or because of cardinal changes in the relation between inflation and output, this situation is observed.



Graph 1. *Evolution of key policy rates*
Source: Lenza, & Reichlin (2010).

Unconventional monetary policies (UMP) comprise two types: *(i)* policies to restore market functioning and intermediation through targeted liquidity provision and private asset purchases; *(ii)* policies to stimulate economic activity at the zero lower bound relying on forward guidance and bond purchases. Unconventional measures implemented by monetary authorities was successful in terms of providing market functioning and intermediation early in the global financial crisis, in response to acute macroeconomic shocks. As an essential part of UMP, pursuing zero-level bound policies led to reducing long-term rates and some positive trends in economic activity while was not able to eliminate financial stability risks. Based on general equilibrium models (IMF's GIMF and standard multi-country DSGE models), aggressive monetary accommodation (keeping interest rates low for an unusually long time) in the countries preferred to use UMP in response to negative shocks, give advantages for non-UMP countries. Extremely low interest rates together with bond purchases induced further capital outflows than would be warranted just by lower interest rates, due to portfolio rebalancing effects, with investors seeking to replace their government bond holding with equivalent bonds in non-UMP countries with higher returns not depending on cutting levels in rates. On the other hand, prolonged period of capital inflows and cheap foreign financing impose significant risks for ensuring financial stability. According to Rajan (2013), these risks are closely related to the factors like low underlying productivity growth, persistent high unemployment, the need for large supply-side adjustments, especially, unequal sector and regional distribution of the impacts on activity, the possibility that firms' preferences to keep labor saving capital at very low rates and income effects that could rise relative to the substitution effect of low rates, possibly dampening downward pressure on savings. In this context, central banks have to cope various strains of the financial crisis through massive complementary policy packages like increasing liquidity provision to their banking systems elastically, accommodating banks' increased demand for liquidity, starting to purchase medium and long-dated public sector securities, or securities guaranteed by governments, offering explicit verbal guidance on the evolution of policy in the future and etc.

After emerging of the crisis, central banks in advanced countries started to implement MP-Plus policy packages in which the range of policy tools is very extensive. (IMF, 2013a) The most massively used tool among them is quantitative easing (QE) which involves direct purchases in government bond markets to reduce yield levels or term spreads when the policy rate is at or close to the lower bound. Considerations toward QE and its impact on monetary system are differential. It is appreciated as a policy approach with three features *(i)* explicit

targets for bank reserves; *(ii)* a conditional commitment to maintain high reserves levels into the future; and *(iii)* increased purchases of government bonds to facilitate the attainment of the target on bank reserves. (Ugai, 2006) According to some scholars, it is a mixture of bank reserves policy and quasi-debt management policy which involves a specific communication strategy about the future of banking and financial system. Spiegel (2001) assesses quantitative easing as a policy to reduce long term interest rates through the expansion of reserves. QE is also characterized as the purchase of public and private sector assets using central bank money which includes a combination of bank reserves, credit and quasi-debt management policies. (Benford et. al., 2009) Asset purchases can affect longer-run interest rates by lowering the expected path of short-term rates as well as by reducing the term premium of long-duration securities.

The second one is credit easing (CE), which took the form of central-bank purchases of private or semi-private assets – such as mortgage- and other asset-backed securities, covered bonds, corporate bonds, real-estate trust funds, and even equities via exchange-traded funds. The aim was to reduce private credit spreads (the difference between yields on private assets and those on government bonds of similar maturity) and to boost, directly and indirectly, the price of other risky assets such as equities and real estate. Bernanke (2009) describes credit easing, in the model of U.S. monetary system, as the range of lending programs and securities purchases which implies extension of credit to a wide range of private sector entities, bank and non-banks, as well as purchases of Treasury and government-sponsored enterprise debt. Central banks choose credit easing policies mainly targeting to improve financing conditions for the non-financial private sector. The scope and range of measures generally are formulated in accordance with the specific characteristics of the impairment and the idiosyncrasies of the markets targeted, as well as, more broadly on the financial structure of the economy and the set of tools available to the central bank. These measures encapsulate a broad range of transmission mechanism like the provision of liquidity to financial market participants outside the usual set of central bank counterparties, the provision of liquidity – or collateral – against securities not normally accepted for use in monetary policy operations and outright purchases of assets.

The other unconventional tool is "signaling" channel which provides substantial increments in investments through tiny changes in policy rates. This channel requires adjusting monetary policy instruments with the central banks' targets effectively in order to ensure coordination. Furthermore, it implies shaping expectations about the expected future path of the policy rates. (Brainard, 2015) This channel is particularly essential in terms of forward guidance programs implemented by central banks. Through signaling central banks can mitigate uncertainties relating to realignments in policy rates. In this context, forward guidance policy should be mentioned as a wide approach inherent to central banks which confronted this problem. Generally, forward guidance implies managing market expectations of future policy with explicit communication on the central bank's reaction function and economic projections. Monetary policy decisions can be influenced by both current and expected future policy settings. Therefore, formulating a signal tool to announce a future path of interest rates or any other policy measures could affect market expectations and increase policy effectiveness. Forward guidance is similar to conventional policy in that it provides information about short-term interest rates which affect broader interest rates that influence spending by consumers and businesses. However, forward guidance differs from conventional policy in that it carries a greater risk of being misinterpreted. (Woodford, 2012) Indeed approaches toward forward guidance rationality are also debatable. In spite of the fact that forward guidance can also be applied in normal

conditions, it has widely used and contributed substantial positive results at the zero lower bound. (Yellen, 2012) According to various investigations in this field (Eggertsson & Ostry, 2005; Woodford, 2012), especially at the zero bound level, forward guidance is an effective tool which can be used to manage expectations of participants and their confidence to central banks' policy commitments. On the other hand, some studies (Moessner & Nelson, 2008; Anderson & Hoffman, 2010) emphasize that the extent to which forward guidance improves central banks' control over long-term interest rates is weak.

The effectiveness of forward guidance depends on central banks' reactions to market tensions and expectations. Assessment of forward guidance is very problematic because of difficulties of including all parameters which can influence formulation of policy rates. Therefore, forward guidance has several limitations. The primary limitation of forward guidance is that future policy rates are also limited by the zero lower bound during the financial crisis in most developed economies. Instead, many central banks have used other tools such as announcements about the future path of the policy rate (forward guidance), or quantitative easing measures involving a change in the size and the composition of the central bank balance sheet. (Del Negro et. al., 2015) With expected future rates so low, forward guidance has little room to stimulate the economy without stretching the horizon of forward guidance four or five years ahead. At the current zero bound policy rates period, forward guidance can also originate time-inconsistency problem. This happens because of central banks' efforts to convince the market and its participants that old policy rule will be avoided by allowing inflation (and output) to be higher in the recovery. On the other hand, within emergence of the recovery flickers, central banks prefer to go back on their pledge to keep rates low and raise interest rates in accordance with its old rule which leads to losing of confidence to central banks' credibility in markets.

Furthermore, theoretically, asset purchases and forward guidance can fuel asset price booms over time by affecting directly prices of the purchased assets and indirectly prices of other assets via portfolio rebalancing. The degree of stimulus from forward guidance on future accommodative monetary policy depends on its impact on bond yields and other asset prices. Upon the normalization of monetary policy, at least some parts of the increments in asset prices will be reversed and contributed to potential negative implications for financial stability and growth in the adjustment period. The expansion of monetary stimulus has thus the potential to increase marginal costs, especially if very high valuations are already apparent.

As shown in the Table 1, there are some concerns related to effectiveness and side-effects of these unconventional policy instruments. It is widely accepted issue that the objectives of MP-plus are to benefit not only the macro economy but also financial stability. (IMF, 2013b) MP-plus was considered as a tool package to mitigate short-term instability in financial markets and vulnerabilities in the domestic banking sector through enabling provision of liquidity to banks and buying specific assets. Taking in general, it can be said that implementation of these policies were successful in terms of ensuring advanced central banks to ensure their domestic goals, and were especially effective at the time of greatest financial turmoil. According to IMF, MP-plus also indirectly limits stress in the financial sector to the extent that it succeeds in preventing a sharper economic downturn. By encouraging economic activity through easing of credit conditions, MP-plus can help strengthen private and public balance sheets and thus make a more durable contribution to financial stability.

Table 1.*Risks from MP-Plus and Mitigating Policies*

MP- Plus Policy	Potential Risk	Risk Assessment	Mitigating Policies
Prolonged periods of low interest rates	Pressure on the profitability and solvency of financial institutions	Low	Robust capital requirements
	Excessive Risk Taking (search for yield)	Low	Vigilant risk-based supervision, robust capital requirements
	Ever greening, delay in balance sheet	Medium	Vigorous pursuit of balance sheet repair
Quantitative easing	Dependence on central bank financing	Medium	Improved liquidity risk management in banks, implementation of liquidity requirements, design of systemic liquidity risk mitigants
Indirect credit easing	Dependence on public sector financing	Medium	Improved liquidity risk management in banks, implementation of liquidity requirements, design of systemic liquidity risk mitigants
	Distortion of allocation of credit, possibly weakening underwriting standards	Low	Vigilant risk-based supervision, dynamic forward-looking provisioning, robust capital requirements
	Delay in balance sheet repair	Medium	Vigorous pursuit of balance sheet repair
	Reinforcement of bank–sovereign links	Medium	Vigorous pursuit of balance sheet repair, robust capital requirements
Direct credit easing	Distortion in prices and market functioning	Low	Address associated market risks

Source. IMF (2013a), *Global Financial Stability Report: Old Risk, New Challenges*

The impact of unconventional monetary policies on the rest of the world is ambiguous. Although massively used by monetary authorities, these unconventional measures, in particular, the zero nominal bound on interest rate which was appreciated only a theoretical possibility prior to the crisis had been reached and zero-interest-rate policy had been implemented, growth remained anemic. In early periods of implementation- at the most intense period of the financial crisis, these measures which have strong market and macroeconomic impact,contributed to buoyed asset prices globally, and likely benefited trade through bolstering confidence and providing financial markets with liquidity. But following this positive trend, their effects began to be much smaller together with triggering increments in capital flows to emerging markets.

Among unconventional monetary policy tools, negative nominal policy rates can be assessed as the latest measure which began massively implement by monetary authorities. Cutting policy rates to "zero lower bound" enables central banks to provide further stimulus if real interest rates are still above the levels consistent with price stability and full employment. When nominal rates become negative, the transmission mechanism of monetary policy may also differ as there is non-linearity associated with the downward stickiness of retail deposit rates. Negative rates are used both in advanced and emerging economies with the purpose to encourage the private sector to spend more and support price stability by further easing monetary and financial conditions and also mitigate deflationary pressure on economy. Empiric investigations depict that in many in many economies – including Europe and the United States – real (inflation-adjusted) interest rates have been negative, sometimes as much as -2%. And yet, as real interest rates have fallen, business investment has stagnated.According to the OECD (2016), the percentage of GDP invested in a category that is mostly plant and equipment has fallen in both Europe and the US in recent years. (In the US, it

fell from 8.4% in 2000 to 6.8% in 2014; in the EU, it fell from 7.5% to 5.7% over the same period). One of the approaches toward implementation of zero or negative real interest rates is that their using as temporary tools undermines the efficient allocation of capital and set the stage for bubbles, busts, and crises. Furthermore, according to some scholars, massive implementation of these measures contribute to further income concentration at the top by hurting small savers, while creating opportunities for large financial players to benefit from access to savings at negative real cost

Table 2. *Central Banks that Have Introduced Negative Policy Rates*

CountryCountry	Date negative rate first introduced	Latest policy rates, basic points (March 2016)		
		Lending rate	Main policy rate	Deposit rate
Danish National Bank	July 2012 to April 2014; September 2014 onwards	5	0	-65
ECB	June 2014 onwards	25	0	-40
Swiss National Bank	December 2014	50	-	-75
Swedish Riksbank	February 2015	25	-50	-125
Bank of Japan	January 2016	10	0	-10
Hungarian National Bank	March 2016	145	120	-5

Source: Viñals & Eckhold (2016)

Incumbent widespread use of unconventional monetary policies is one of the debatable issues among scholars. Some of them consider that may be these measures had significant effects on lowering long-term interest rates; however their side-effects also imposed great hazards for ensuring monetary and financial stability. (Martin & Milas, 2012) In particular, these policies contributed to ignoring asset and bond prices in shaping monetary policies. Two issues dealing with this problem ought to be mentioned: *(i)* violation of fiscal order; *(ii)* discrimination effects during acquisition and redistribution of assets. According to Meltzer (2010) and Taylor (2010), the real reason behind emerging such problems is massive implementation of quantitative easing.

Realignments in monetary policy instruments and target involve very complicated issue in itself. However, it can be said sudden stopping of unconventional measures are also as much dangerous as using them massively. Firstly, calibrating monetary policy stance or lowering liquidity assets or increasing policy rates on zero bound level is very arduous. Secondly, proper forecasting reactions of markets to sudden changes in monetary policies are also seen very unrealistic. For instance, asset selling by central banks can be understood as signal for stock traders. If central banks begin to reduce speed of this process, under the pressure of fiscal authorities, this can result with sharp changes in inflation expectations which in its turn can lead to further surges in long-term interest rates. It should also be noticed that extreme low interest rates are accompanied by high risk premiums, which can contribute to deviations in the process of eliminating troubles relating to restructuring of balance of payments and financial system. The investigations in this field depict that there is strong interrelation between indicators characterizing risk levels in financial markets and monetary policy decisions.

On the other hand, undesirable side effects of unconventional monetary policy tools are also appreciated as significant risks for the realization of central banks' targets in middle and long run. The experience of the countries in which these measures are used widely, provision of ample bank liquidity contribute to emergence of credit risks at banks by compromising underwriting and loan quality standards, and it may encourage a delay in necessary balance sheet repair and bank restructuring. In macro level, as known from economic theory, lowering interest

rates encourage other financial institutions, like pension funds, insurance companies, and money market mutual funds, to increase risk by "searching for yield". Furthermore, lower interest rates are also key factors which can contribute to massive lending to borrowers (borrowers with a bad credit history for example that due to an improvement in their net worth are not so risky anymore) that were deemed in the past to be too risky (Bernanke et. al., 1996) or the ones with fewer pledgeable assets. (Matsuyama, 2007) Moreover, presence of lower interest rates may lead to reducing the threat of deposit withdrawals, abating adverse selection problems in credit markets through allowing banks to relax their lending standards and to increase their credit risk-taking. (Jiménez et. al., 2008) This situation in markets makes it available for low levels of short-term interest rates to lead financial institutions to a search-for-yield through transforming riskless assets less alluring. (Rajan, 2006)

In the framework of poor risk-based prudential supervision and capital requirements, this "searching" push the market value of some assets beyond their fundamental value ("bubbles") or drive an excessive increase in balance sheet leverage. This situation is stringently similar to the phenomenon calling "Greenspan put" which involves the monetary policy conducted by Fed aiming to provide liquidity in financial markets prior to the crisis. (Bekaert, 2013) However this policy contributed to appearing of asset "bubbles" in markets and made policymakers take into consideration potential risks for financial markets stemming from expansionist monetary policies.

One of the side- effects of unconventional policies is sudden stops or exiting these measures. More than 5 years, central banks are continuing accommodative policies which have contributed to swelling of their balance sheets. Within massive implementation of unconventional monetary policy tools, monetary authorities have begun to use actively their balance sheets in order to mitigate pressures on markets and create a shunting area for financial intermediates, also enhancing effectiveness of transmission of accommodative policies on the markets. The urgent needs make central banks to use balance sheets in this process can be listed as below (ECB, 2015):

The need to respond to financial stress and manage financial crises – in line with central banks' traditional function as the ultimate provider of funding reassurance for the banking system; The need to enable or improve the transmission of the intended monetary policy stance in the presence of market impairments; The need to provide additional monetary accommodation – that is, to further ease the stance – by exerting downward pressure on long-term interest rates when short-term nominal policy rates have been reduced to their effective lower bound.

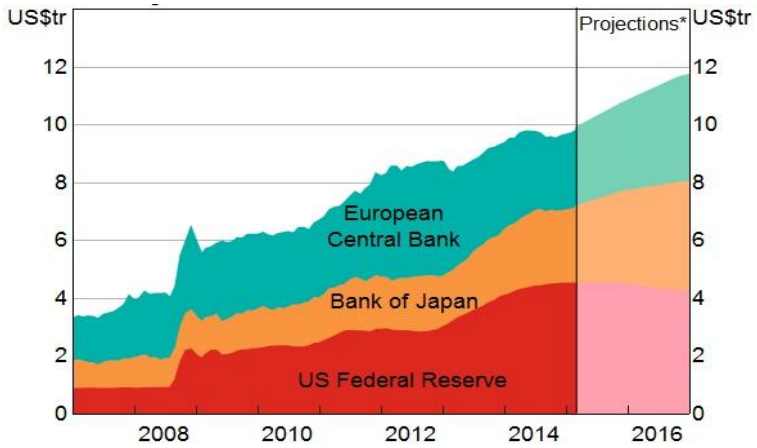
In order to realize these, central banks choose provision of massive amounts of domestic and foreign exchange liquidity to prevent stress in key markets from hitting the real economy as an efficient way. The lower bound constraint on monetary policy interest rates forced several major central banks to switch to purchases of long-term public bonds and even foreign exchange to further ease their policy stance. With the purpose to reduce impact of financial stresses on the real economy, in particular, the vulnerabilities which active liquidity provision to funding and credit markets can create, central banks formulated specific policies used to support financial stability broadly warrant inclusion for use to counter systemic financial stress.

Table 3. *Unconventional Central Bank Balance Sheet Policies*

Objective	Policy	Inclusion in the toolkit
Financial stability	Liquidity provision to funding and credit markets	Appropriate when liquidity stress spilling over into real economy but with safeguards and coordination
	Foreign exchange liquidity provision to local markets	Appropriate when foreign exchange liquidity stress spilling over into real economy but with safeguards and coordination
Macroeconomic stability	Bond purchases	Effective for highly credible central banks to a degree when the policy rate is at the lower bound but there are risks and policy overlaps
	Large-scale foreign exchange intervention	Effective for highly credible central banks in stemming appreciation in the short-run but also poses important policy, balance sheet, and multilateral risks
	Credit provision to the private sector	Weak case to be done by the central bank vis-à-vis the government in all but the most exceptional circumstances

Source: Stone, Fujita, & Ishi, (2011).

On the other hand, within evolving unconventional measures and growing financial imbalances, it became obvious that expanded balance sheets can contribute to increasing risks like markets or portfolio risks (through purchases of long-term debt), credit and exchange rate risks. Large balance sheets are potential sources for emerging portfolio risk, partly in the form of high leverage. The balance sheets of major central banks have expanded from around $5-6 trillion prior to 2007/2008 to over $18 trillion. In many developed countries in which QE policies are actively used on base of zero bound levels, central bank assets constitute between 20% and 30% of GDP.



Graph 2. *Balance Sheets of Advanced Central Banks*
Source: Bloomberg, RBA & Thomson Reuters
Note: Based on central bank communicated intentions assuming constant exchange rates

Active using of balance sheets requires central banks to act in a broad array of financial markets in order to substitute their own balance sheet for that of private intermediaries. In the period of the most severe recession, this active participation is accepted as a sound signal to mitigate dysfunction and inertness in of the markets. Within expanding gradual normalization process in monetary policies, however, this dominant role can contribute much more devastating outcomes through cardinally changing market conditions. Firstly, central banks with excessive balance sheets are subjected to interest rate risks. Sudden or more-rapid-

than-expected rise in interest rates, especially longer-term interest rates will be accepted as central banks' intentions to dissolve their profuse portfolios. This preconception which is formed under the expectations of future declines in bond prices, in its turn, will lead to the increasing of speculations and chaos in the markets. The efforts by central banks to shrink their balance sheets are also risk-originated sources which can disrupt markets, particularly, if market vulnerabilities are not completely solved. Uncertainty about the necessity or willingness of central banks to sell their large portfolios of government bonds and other assets could lead financial markets to overreact when central banks begin to sell these assets. Fears that central bank sales could lead to falling bond prices may prompt private investors to dump bonds, which could lead to the previously mentioned sharp increases in interest rates (Oppers, 2013).

All these indicate that it is very complicated and debatable issue to exit accommodative policies in the context of long lasted implementation of unconventional measures and fragile and unsustainable recovery challenges in global economy. Lack of appropriate and timely policy measures can highlight adverse results of exit from unconventional measures. Active participation by central banks in markets can lead to deterioration of market functioning or missing major vulnerabilities rather than mitigating instability or lack of confidence. Contemporary policies following by major central banks are mainly related to this issue. Presence of highly destructive downturns in markets, financial and macroeconomic instabilities in major advanced and emerging economies, transitional processes in global economy make central banks to exit and reduce unconventional measures gradually. According to IMF estimations, if U.S. growth rate would be 1% lower than expectations, this would contribute to 0.2% decrease in global output (approximately same results are relevant to Eurozone). (IMF, 2013c) Moreover, estimations depict that financial system shocks which erupted after leaving unconventional policy tools, can originate much more detrimental impact on economic activity by increasing risk premiums to the level observed in the crisis. For instance, such shocks in U.S. can be accompanied by 1.7-1.9% reduction in global output while the level of decrement is estimated nearly 0.5-0.7% if they are observed in EU. On the other hand, exiting UMP can be synchronically observed together with central banks' stopping in buying T-bonds. In the economies in which fiscal consolidation and large budget deficits exist, giving up UMP would result substantial increments in taxation. In this case, 1% point rise in taxes/GDP share in the U.S. would lead to restrict global GDP growth 0.6-0.8%. Applying this estimation to Eurozone, it can be observed that 1% point rise in taxes/GDP share would diminish global output growth 0.2-0.3%. In the context of continuing but at an increasingly disappointing pace of global growth, supporting and guarding it against downside risks constitute priority for policymakers in all levels. The new World Economic Outlook (IMF, 2016) anticipates a slight acceleration in growth in 2016 relative to 2015, to a 3.2% rate of growth, followed by a further acceleration to 3.5% in 2017. However, these projections continue to be progressively less optimistic over time. The reasons lying under this trend require multi-pronged policy approach on monetary, fiscal and structural policies. Therefore existing strategies from UMP should be formulated based on factors affecting global growth patterns substantially like growing inequality, structural reforms, China's growth model transformation and its impact on other economies and etc. The experience of exiting accommodative monetary policies shows that it would be much easier to mitigate their effects if countries can achieve to formulate foreign currency reserve buffers, to use exchange rates as shock absorbers. It should be paralleled with effective monetary-fiscal policy coordination both in macro and international levels.

4. Classic Dilemma in front of Central Banks: Monetary or Financial Stability?

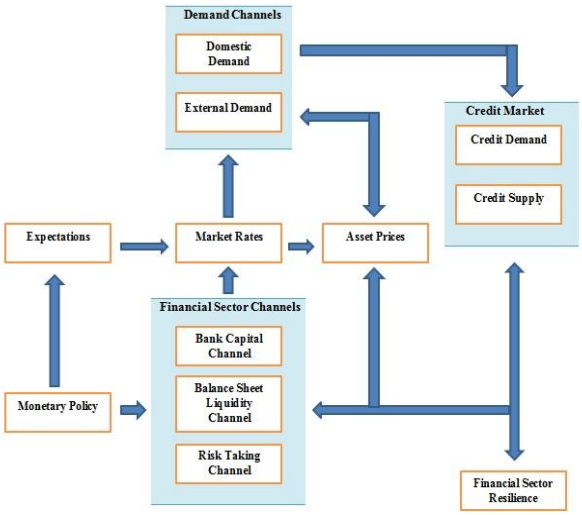
Financial crisis in 2007-2008 and its long lasting impacts resulted with changes in macroeconomic policy framework. Prior to the crisis, there was a common anxiety relating to potential deleterious impact of financial disruptions on the economy, particularly, in the phase of outstanding global economic growth patterns. The financial crisis and Great Recession have prompted a rethink of monetary policy and central banking through verification of monetary policy frameworks focused primarily on maintaining price stability, as price stability has proven not to be a sufficient condition for financial stability and lack of financial stability can have large negative feedback effects on price stability. The crisis also revealed that safety and soundness of individual financial institutions could not ensure stability of whole financial system. The experience of the crisis makes it necessity to revise both macro and micro-prudential policies in order to ensure financial stability by increasing the resilience of the financial sector and reducing its pro-cyclicality.

On the other hand, the crisis indicated that ensuring stability of inflation and output cannot be accepted enough in terms of guarantying macroeconomic stability. Therefore adjusting interest rate policies with financial conditions are very essential. Severity of the recession and inadequacy of the policies made it obvious that international capital swings also impose high level of volatility. These volatilities are very destructive particularly for the open economies which possess underdeveloped financial markets, high levels of reserve accumulations and undiversified economic systems. The impact of capital flows can be direct (through current account balance and aggregate demand) and indirect (through current balance to financial stability). If local currency begins to appreciate with the help of flows, the financial sector can lose its competitiveness. From its initial stage, the crisis depicted that framework of classic multiple-equilibrium which encapsulated insuring bank deposits and provision them with "lender of last resort" had begun to be applied wholesale funding and non-bank intermediaries. The debt crisis in the EU made it obvious that this tendency was also characteristics for sovereigns. Governments whose revenues are consisted of future tax collections are exposure to liquidity problems much more than financial intermediaries. Therefore central banks' duty to ensure liquidity not only for banks and non-deposit-taking institutions but state budget has become actual problem. Furthermore, general equilibrium modeling frameworks used at central banks until the crisis did not incorporate financial frictions as a major source of business cycle fluctuations. This led to a dichotomy between monetary policy and financial stability policy in which these two types of policies are conducted separately.

The crisis proved the importance of financial factors in the process of identifying macroeconomic fluctuations. The consensus prior to the crisis dictated that central banks do not need to take into consideration the effects of financial variables on inflation. However, the analysis based on DSGE model indicates that central banks' implemented pro-cyclical policies relied on standard Taylor rule which led to increments in business cycle volatilities. (Gambacorta & Signoretti, 2013) After the crisis, monetary authorities' approach has become much accommodative and counter-cyclical in the framework of "leaning against the wind" policies intending to minimize impacts of financial frictions. Research on various policy tools reflect that central banks' reactions to financial variables help them to get a suitable stance between inflation and output, particularly when credit supply has a significant impact on real economy. Maintaining financial stability

can help to ensure a well-working financial system and an effective transmission process which makes achieving price stability more efficient.

Generally, it is accepted that monetary policy can bolster financial stability using various transmission channels. It is widely known that monetary policy affects the general level of prices, at least in the long run, and that it may influence output only transitorily. The final target of monetary policy- price stability generates certainty about the real level of debt, and stable economic growth helps companies to service debt and maintain healthy balance sheets. However, empirical researches depict that financial imbalances have become much devastating in the context of limited effectiveness of monetary policy through redirecting its setting from what it needs to maintain price stability in the medium term. Monetary policy seems neither the most effective nor the most efficient tool to use if the aim is to safeguard financial stability.



Graph 3. *Relation between Monetary Policy and Financial Stability*
Source. Bank of England, Financial Stability Report, № 33, June 2013.

As seen in the Graph 3, the relation between monetary policy and financial stability is highly multi-correlated. Central banks' considerations toward asset bubbles are also crucial issues in terms of appreciating transmission channel of monetary policy decisions to financial stability. Indeed, there are controversial empirical results regarding with efficiency of regulation asset bubbles by monetary policy tools. The theory of optimal monetary policy requires that monetary policy responds to asset prices in order to obtain good outcomes in terms of inflation and output. Hence, the issue of how monetary policy might respond to asset-price movements: whether it should not respond at all (*leaning* against asset price bubbles) or it should respond over and above the response (*cleaning* up after the bubble bursts) is called for in terms of objectives to stabilize inflation and employment. (Borio & Lowe, 2002) Prior to the crisis, the predominant view had been that speculative bubbles could not be identified in real time so that the only solution was to adopt measures to diminish the negative effects of such bubbles after their burst, although it was clear that such an approach encourages moral hazard and excessive exposure to risk. (OECD, 2011) However, some economists (Cecchetti et. al., 2000; Borio & Lowe, 2002; White, 2004) considered that the best way to struggle against bubbles and their negative outcomes would be raising by raising interest rates in the light of "lean against the wind" concept. Fed former chairman Bernanke and others (Bernanke & Gertler, 2001; Gilchrist & Leahy,

2002) argued that monetary policy bubbles would not have tremendous effects in asset markets to eliminate "bubbles". Based on the experience of last crisis, it becomes obvious that interest rate increments can lead to negative effects not only in financial markets, but also in macroeconomic context. According to Greenspan (2002), asset bubbles are capable to affect inflation and employment in direct or indirect ways which makes it much more appropriate for monetary policy to clean up bubbles after they burst rather than leaning against them. His arguments can be listed as below:

Detecting a bubble is really hard in terms of identifying it while it is in progress; Because of market participants' high returns expectations from bubble-driven assets, interest rate increments is not adequate method against them; It is ought to be taken into account that monetary policy actions are a very blunt instrument in detecting all bubbles through affecting the asset prices in general, rather than solely those in a bubble; Theoretical models indicate that raising interest rates with the purpose to mitigate possible hazards of rising asset prices can result with much more damage for economies than acceleration of bubbles.

Analyzing prior-to crisis period indicate that financial distress can be result of loose or benign economic conditions. The phenomenon called asset bubbles indeed appears as a result of fluctuations in various economic drivers like demand, financial sector and credit channels. For instance, loosen monetary policy trigger households and firms to increase consumption and investment spending, some of which may be financed by credit. In the period of low and stable inflation, favorable supply-side developments and easier access to external finance anchor expectations dealing with price stability. These optimistic assessments of risk lead to unsustainable expansion of aggregate demand by inducing greater stickiness in price and wages. Monetary policy can also affect aggregate demand through exchange rates variations which in its turn would contribute to appearing of financial stability problems by creating imbalances in relative prices of domestic and foreign goods and services. Furthermore, two main components of affecting asset bubbles are the impact on net interest margins and the impact on credit risk and asset write-offs which tempt financial institutions to refrain from loans to borrowers in distress.

Effects on monetary policy stance on risk perceptions or risk tolerance are one of the transmission channels lead to emerging bubbles. The effects of loose monetary policy which mainly contributed to excessive risk taking in financial markets have become one of the rekindling issues within the last crisis. Monetary policy can affect strongly risk aversion and uncertainty which are key variables influencing business cycles. Investigations (Adrian & Shin, 2008) indicate that lax monetary policy induces excess leverage as in perhaps monetary policy is potent enough to weed out financial excess. Conversely, in times of crisis and heightened risk aversion, monetary policy can influence risk aversion and uncertainty in the market place, and therefore affect real outcomes. This situation can avoid monetary policy from its primary goal- preserving price stability through trying to smooth fluctuations in financial sector which indeed would dampen market signals and increase risk aversion.

The way to preserve financial stability is still complicated, in particular in the context of revising monetary authorities' stance and mandates. The investigations and challenges of post-crisis indicate that central banks should be responsible to conduct macro-prudential policies in order to achieve financial stability. Within erupting of the crisis, it becomes obvious that dividing financial stability responsibilities between central banks and financial regulatory authorities has led problems in linking policies in these fields and also in the institutional management field. (Kawai & Morgan, 2012) Generally, the introduction of macro-prudential

policies can improve the trade-offs for monetary policy and increase its room for maneuvers. Macro-prudential policies can by managing the financial cycle and increasing the resilience of the financial sector reduce the probability of systemic stress trade-offs that may arise when exiting accommodative monetary policies. (Smets, 2013) This requires solid and well-designed coordination mechanism between macro-prudential and monetary policies. This is especially important to reduce negative impacts of macro-prudential policies on the effectiveness of monetary policies. In the absence of compensating each other's deficiencies, consolidation of responsibilities for charging both policies can be assessed adequate in the current stage. This consolidation requires clarifying both institutional and policy-setting responsibilities.

Table 4. *The Relation between Monetary and Macro-Prudential Policies in Various Views*

	Modified Jackson Hole consensus	Leaning against the wind vindicated	Financial stability is price stability
Monetary Policy	Framework largely unchanged; Limited effects on credit and risk taking; Blunt instrument to deal with imbalances	Financial stability as secondary objective: lengthening of horizon; Affects risk-taking; "Gets in all of the cracks"	Twin objectives on equal footing; Unblocks balance sheet impairments; avoids financial imbalances in upturns
Macro prudential	Granular and effective	Cannot fully address financial cycle; arbitrage	Indistinguishable from monetary policy
Interaction	Limited interaction and easy separation of objectives, instruments, …	Financial fragility affects monetary transmission are price stability Financial stability and price stability are intimately interlinked	Financial stability and price stability are intimately interlinked

Source: Smets (2013).

Modified Jackson Hole approach implies that, monetary authorities should keep their mandate in preserving price stability while macro-prudential authorities have to be charged in financial stability. According to this approach, the relation between macro-prudential and monetary policies and their transmission mechanisms differ substantially and this relation is restricted. However, according to "Leaning against the wind" conception, financial stability should not be primary target of monetary policy. This view argues that the narrow focus of many central banks on the inflation outlook over the relatively short term of two to three years prevented them from leaning more aggressively against growing financial imbalances. The third approach shows that there is an urgent need to realign in the targets of monetary policy. This view implies that they are so closely related that both standard and non-standard monetary policies are in the first place attempts at stabilizing the financial system, addressing malfunctioning financial markets and unclogging the monetary transmission process.

As shown in these approaches, the need for coordination between monetary policy and financial stability is unambiguous. In spite of the possibility of conflicts between these policies in the short-term, this coordination should be achieved in medium and long terms in order to ensure sustainable macroeconomic stability. Central banks do not need to target asset prices directly; however, they should originate preventive measures against the possibility of appearing systemic risks deriving from credit cycles. The degree of the relation among these policies ought to depend on their impact of economic cycles and financial markets.

5. Conclusion

In the aftermath of the global financial crisis and with a focus on macroeconomic imbalances in the world, the ways central banks and generally,

monetary policies operating have become crucial issues for economic investigations. Mandates of central banks and their stance in provision of financial and policy stability require substantial realignments in the context of challenges of the post-crisis conjecture.

In the light of contradictious approaches to the central banks' policy tools and current mandates in preserving macroeconomic stability, the policies used by central banks to cope with imbalances are debatable issues in terms of effectiveness and purposefulness. The experience shows that unconventional monetary policies can be effective at overcoming the limitations on policy at the zero lower bound by operating through channels broadly similar to conventional monetary policy. However, relying on these measures, in the medium and long term can be resulted with future imbalances. Weak banking sector, debt overhang problems in the household and government sectors, as well as greater macroeconomic and policy uncertainty are the factors dampening efficiency of these measures. Bond purchases, massively used, particularly by advanced central banks seem to exhibit diminishing effectiveness, and their growing scale raises risks. Some evidence also suggests that these policies encouraged growth and prevented deflation, although this conclusion is less clear-cut, given the long lags and unstable relationships between variables, and the unresolved question of what would have happened without central bank policy intervention. Exceptionally accommodative and prolonged monetary easing can be counterproductive, as it can delay the necessary restructuring of balance sheets and, in the longer run, undermine the credibility of central banks (Bech et. al. 2012). Restricted by the lower bound, central banks cannot fully realize their target of preserving macroeconomic stability using balance sheet policies. Enhanced liquidity provision, relaxation of collateral rules, and sizable asset purchases have led to increases in the absolute size of central bank balance sheets, together with leading to risks like (i) implicit or explicit valuation losses as a result of a rise in interest rates; (ii) declines in operating income when central banks increase their holdings of long-dated securities with low coupon interest rates; (iii) possible impairment losses on assets with credit risk and etc.

Furthermore, continuation of monetary easing can lead to various forms as (i) excessive risk taking and emerging of new asset bubbles which threaten financial stability; (ii) shaping of inflation expectations in a wrong way through damaging central banks' targeting and policy efficiency in this field; (iii) making it much more problematic for central banks to switch to normalization in monetary policies (taking into account that such prolonged period of low rates make it compulsory fulfill substantial adjustments and financial institutions) and other issues relating to provision of liquidity, realizing macro-prudential regulation and etc.

It is undeniable truth which extracted from recent economic imbalances that monetary authorities cannot manage the economy with just interest rate and an inflation target. As central banks move away from the simplicity and well-rehearsed routine of interest rate policy, they face much trickier calibration and communication issues. This is especially crucial in the sphere of maintaining financial stability and surveillance of markets. The outcome derived from various investigations implies that monetary authorities should include financial stability among their targets in achieving macroeconomic resilience. They can regulate and influence financial stability in various ways including actively participating in the markets or only using indirect transmission mechanism depending on economic situation. The correlation between monetary policy and financial stability, the stance and policy toolkit of central banks' in this field should not be assessed in a limited hypothesis and variable databases as in the most pre-crisis models and suggestions. Because of scope of the article, issues relating to banking sector and is

impact on preserving financial stability are not analyzed in depth. However, it is obvious that central banks are not able to attain financial stability if banking sector exhibit weakness against economic stagnations and do not reduce their involvement in speculation and financial gambling.

Consequently, the global financial crisis has contributed to emerging millennial realignments in overall economic policy making, in particular, because of its nature, in monetary policy. In spite of lots of conventional and unconventional tools have been introduced by monetary authorities to mitigate adverse consequences of imbalances, these policies have always been criticized because of their unforeseen and unwelcome consequences. For these reasons, formulating new frameworks for monetary policy, enhancing effectiveness of its transmission mechanisms and most notably, providing monetary authorities with sufficient tools are the substantial and urgent challenges in the post-crisis fragile recovery stage.

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