

BAFFI CAREFIN
Centre for Applied Research on International
Markets, Banking, Finance and Regulation

Working Paper

Donato Masciandaro and Davide Romelli

From Silence to Voice: Monetary Policy, Central Bank Governance and Communication

BAFFI CAREFIN Centre Research Paper Series
No. 2016- 27

This Paper can be downloaded without charge from The Social
Science Research Network Electronic Paper Collection:
<http://ssrn.com/abstract=2815779>

From Silence to Voice: Monetary Policy, Central Bank Governance and Communication

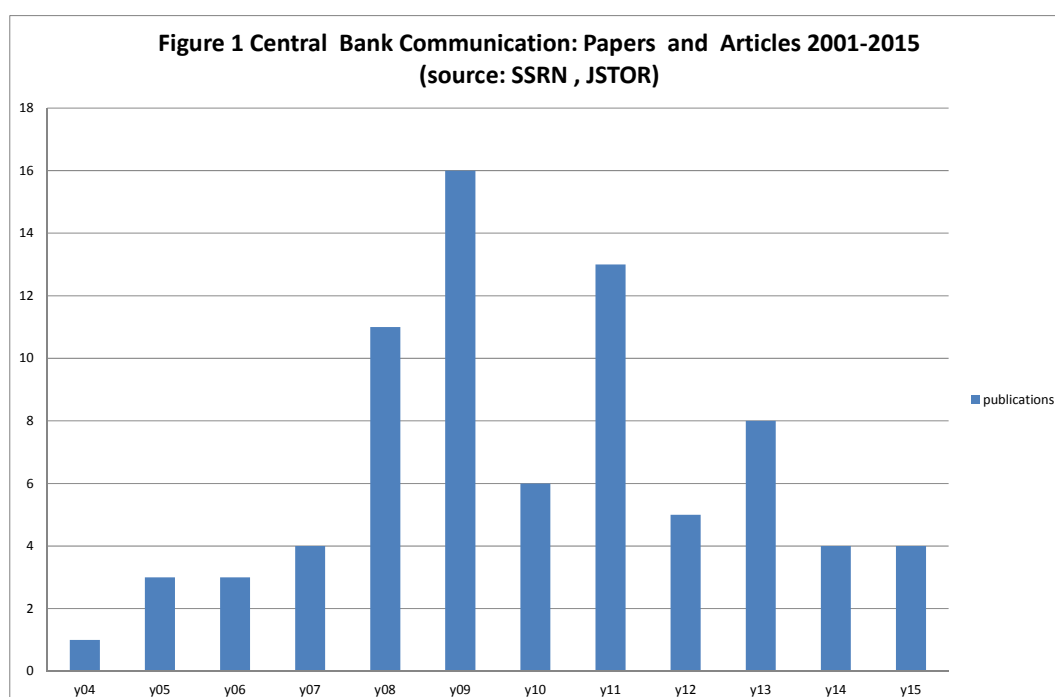
May 2016

Donato Masciandaro¹ and Davide Romelli²

1. Introduction

In the Concluding Remarks that Paolo Baffi - Governor of Bank of Italy - read on 31 May 1979, he stressed that “the actions of central banks are no longer cloaked in silence, and perhaps never will be again. Whereas in the past silence was seen as a guarantee of independence, today this is achieved by giving an explicit account of one’s actions”. In the Governor’s words it is evident and illuminating the precognition of the increasing importance of the links between monetary policy, central bank governance and communication in influencing the overall effectiveness of the monetary action in the modern economies.

Only in the 2000s the economic profession began to take notice of central bank communication as an autonomous policy area. Just to give an indication of the growing interest since then, it is interesting to conduct a search in the economic literature on the terms “central bank communication” (CBC), finding the papers and the articles that had the three words in the title (Figure 1).



¹Department of Economics, Bocconi University and SUERF.

² Trinity College, Dublin.

In the 2001-2015 period 78 papers and articles were published having CBC in the title (yearly average: 5.4 publications), with a peak in 2009 (16 publications). After the peak the number of papers and articles decreased, remaining however significant on average (yearly average: 6.7 publications). Therefore academic interest in the topic seems to represent by now a well-defined niche in the monetary policy field, and the rationale is exactly its interconnections with both the policy design and the central bank institutional regime.

The aim of this note is to present the evolution of the relationships between monetary policy, central banking governance and communication in the last three decades – first the Great Moderation and then the Financial Crisis - as a story of two intertwined tales: on the one side the tale of how monetary policy and central bank governance are two sides of the same coin; on the other side the tale of how such monetary setting influenced the shape of the central bank communication.

2. The First Tale: Modern Monetary Policy and Central Bank Governance

Up to thirty years ago economic theory did not attribute importance to the concept of central bank governance. The institutional arrangements became important when the economic theory started to stress its role in determining the macroeconomic performances, i.e. during the New Classical Revolution. Then the role of the central bank design and governance was confirmed in the New Keynesian analysis of the monetary policy and the relevance of communication progressively emerged.

The theoretical bottom line can be summarized as follows (Masciandaro 1995, Eijffinger and Masciandaro 2014): the policymakers tend to use the monetary tools with a short sight perspective, using the inflation tax to smooth different kind of macroeconomic shocks – i.e. real (Barro and Gordon, 1983) and fiscal (Sargent and Wallace, 1981) unbalances - trying to exploit the trade-off between real gains and nominal (inflationary) costs.

The inflation tax finances the stabilization policies. But the more the markets are efficient the greater the risk that the short sighted monetary policies produces just inflation. In fact the rational private agents fully anticipate the political incentives to use the inflation tax, fully adjusting the nominal variables. In this framework the Friedman–Lucas proposition on monetary policy neutrality holds.

Furthermore, the political inflation bias can dynamically generate greater uncertainty and negative externalities (such as moral hazard risks). The inflation tax is inefficiently used in a systematic way, becoming tendentially high and volatile and then producing only macroeconomic distortions. The inefficient use of inflation tax was empirically confirmed by the fact that the optimal taxation theory did not find any support in the data.

The optimal taxation theory claims that the benevolent policymaker chooses the rate of any taxation – including the inflation tax – to minimize the present value of the social cost;

consequently inflation and tax rates have a positive relationship. If the optimal taxation theory empirically fails it is natural to conclude that the government is not benevolent, being affected by inflation biases.

Therefore, banning the use of the monetary policy for inflation tax purposes becomes the social goal. The institutional setting gains momentum; the relationships (governance) between the policymaker – who designs the overall economic policy - and the central bank -which is responsible for the monetary policy – become crucial in avoiding the inflation bias. The more the markets are rational the more the rules of the game between policymakers and central bankers gain momentum (Barro and Gordon, 1983; Backus and Driffill, 1985; Rogoff, 1985; Lohmann, 1992).

The optimal central bank governance has to be essentially a medal with two sides. On the one side, the central banker has to be independent, i.e. the central bank enjoys the ability to implement the non-inflationary monetary policy without any external (political) short sighted interference. The central banker becomes a veto player against inflationary monetary policies.

On the other side, the central banker has to be conservative, where conservativeness refers to the importance that he/she assigns to price stability in its relation to other macroeconomic objectives. The conservativeness is the necessary step to avoid that the central banker himself/herself becomes a source of the inflation bias. Independence and conservativeness become the conditions to implement credible non-inflationary monetary policies.

The trade-off between conservativeness and independence (Eijffinger and Hoeberichts, 1998) can be addressed using Independence as a tool to implement conservative monetary policies. But the private agents trusts the central banker only if effective rules on accountability and transparency hold. In other words a conservative central banker is credible if he/she works in an institutional setting which guarantees independence and accountability, acting in a transparent way and implementing an effective communication policy.

The relationship between independence and accountability represents the core of the so-called central bank governance. The central bank governance became the institutional setting for implementing the day by day monetary policy: given the long run goal to avoid the risk of inflation, the modern central banker can also smooth the real business cycles (Bernanke and Gertler, 1995; Clarida, Gali and Gertler, 1999; Woodford, 2003), using monetary policy rules (Taylor, 1993; Henderson and McKibbin 1993; Walsh, 1995).

Monetary policy becomes the final outcome of a complex interaction between three main components: monetary institutions, central banker preferences and policy rules (Persson and Tabellini, 1993; Svensson, 1995).

In this respect the huge literature on central bank governance can be described as a two stage process. Initially, the scholars involved in the field went on to verify the theoretical conjectures with comparative, institutional and empirical analysis. After constructing indices of central bank governance (Grilli, Masciandaro and Tabellini, 1991; Cukierman, Webb and Neyapti, 1992; Alesina and Summers, 1993), it has been attempted to determine whether and how the different indices could be considered as drivers in explaining the most important macroeconomic phenomena: inflation, public debt and interest rates, income and growth.

Taking advantage from the first wave of studies on the monetary regimes - including the critical views (McCallum, 1995) – the literature did an important step forward considering the central bank governance as an endogenous (dependent) variable that has to be explained (Posen, 1995). Which are the drivers that can motivate the decision of one or more countries to maintain or reform their monetary regimes? Why and how are the policymakers forced to implement monetary reforms that reduce their powers in using the inflation tax, changing the rules governing the central bank settings? So far various interpretative hypotheses were advanced to explain the genesis of the political process that leads a monetary regime to assume given characteristics.

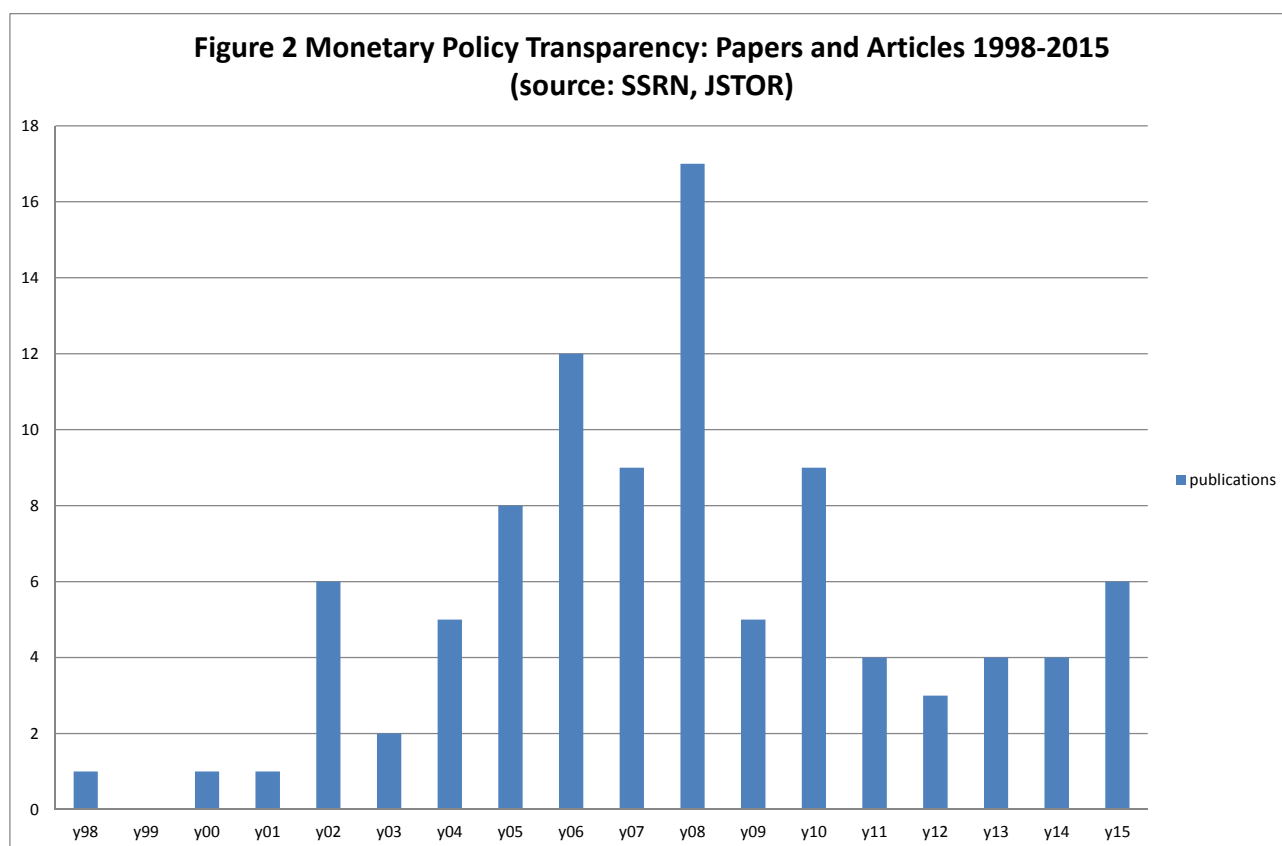
Developments in endogenizing the central bank governance and thereby its effectiveness has been the subject of analysis in both economics and political science. All the hypotheses stress the importance of studying the role of the preferences of both the citizens and the governments in determining the central bank governance features. Furthermore, it is worth noting that the different views can be intertwined in studying under which economic, institutional and cultural conditions reforms of the central bank governance do take place or not. It is also evident that these studies acquire greater importance in periods – as the present period after the Financial Crisis - when there is a tendency to reform, or at least to question, the design of the central bank governance.

3.The Second Tale, Part One : From Ambiguity to Transparency

During the 1970s and 1980s, central banks were very much shrouded in monetary mystique and secrecy (Goodfriend, 1986). The theoretical rationale for the lack of monetary policy transparency and communication was given by the theory of ambiguity, credibility and inflation under discretion and asymmetric information developed in the seminal article of Cukierman and Meltzer (1986). The bottom line was simple: with asymmetric information between the public and a policymaker, monetary policy ambiguity is likely to produce inflationary surprises and consequently short run macroeconomic gains. The mix of a discretionary monetary policy with a short sighted policymaker can justify ambiguity; the negative spillover, with rational expectations, is likely to be an higher and more variable inflation.

Therefore the development of the modern theory of the monetary policy, based on the intertwined concepts of rules in policy on the one side and independence and accountability of the policymaker on the other naturally produced a change in the communication prescriptions: from secrecy to transparency. The monetary policy discretion and ambiguity was abandoned in favour of monetary policy rules explicitly announced and motivated. Transparency became a key features of the central banking policy.

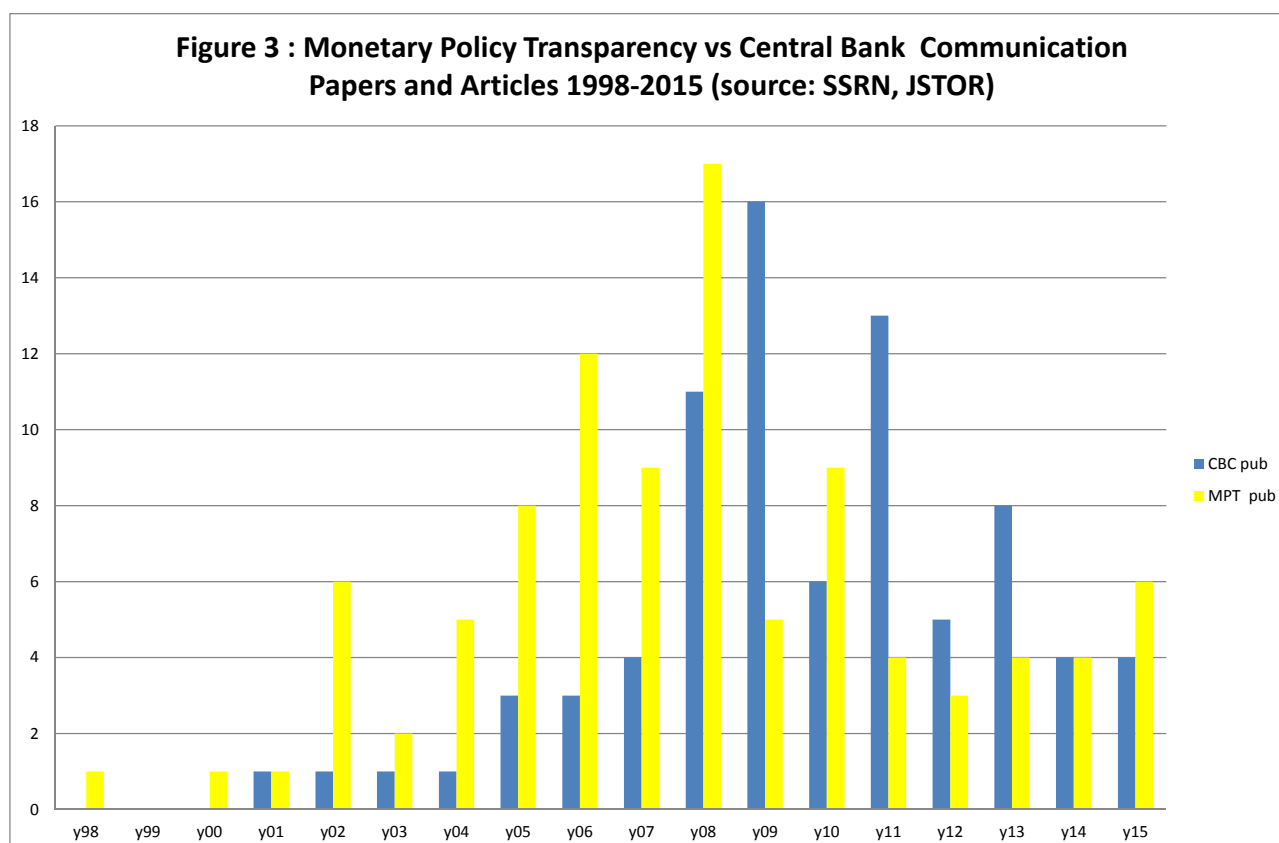
Also the academic profession took notice of central bank transparency as an interesting area of research. Again it has been conducted a search in the economic literature on the terms “monetary policy transparency” (MPT), finding the papers and the articles that had the three words in the title (or alternatively “central bank transparency”) (Figure 2).



In the 1998-2015 period 97 papers and articles were published, having MPT in the title, with a peak in 2008 (17 publications).

It is worth noting that comparing the CBC publications versus the MPT publications (Figure 3), the not surprising results are as follows: 1) the MPT series is a bit older; 2) the total number of MPT publications is sufficiently greater (94 vs 78); the MPT peak is slightly both anterior (2008 vs 2009) and higher (17 vs 16 publications) respect to the CBC peak.

It has been progressively stressed that the effectiveness of central banks to affect the economy critically depends upon their ability to influence market expectations regarding the *future path* of interest rates, and not merely their current level. Therefore, the public understanding of current and future policy becomes critical for the effectiveness of policy. In other words, monetary policy increasingly became the art of managing expectations.



Consequently in the real world transparency of central bank decision-making has increased rapidly from the early 1990s beginning with the adoption of inflation targeting by the Bank of England, Bank of Canada, Reserve Bank of New Zealand and the Swedish Riksbank. Although the Federal Reserve System was officially not conducting inflation targeting, in practice it gradually shifted more or less as to inflation targeting. The European Central Bank adopted from its beginning a so-called two-pillar strategy with a monetary pillar focusing on monetary aggregates like M3, which it inherited from the Deutsche Bundesbank, and an economic pillar taking account of the drivers of inflationary expectations.

At the same time also the changing shape of the institutional setting motivated a shift in the central banks behaviour, that put a much larger weight on their communication with the public. In fact an important trigger for increased transparency has been the requirement for greater accountability of independent central banks. As central banks have become more independent over time, they have to pay closer attention to explaining what they do and what underlies their decisions (Briault, Haldane and King, 1996). More transparency and increased use of communication is partly a logical consequence of this development.

Even though central bank accountability justifies this trend towards more transparency, it is less obvious that more central bank transparency is also beneficial from an economic point of view. Therefore, many theoretical studies tried to analyse whether the trend towards transparency could be justified from an economic point of view as well. These studies vary not only with respect to the different aspects of central bank transparency, such as political, economic, procedural, policy and operational transparency, but also regarding the structure of the economy determining the monetary transmission mechanism (Issing, 2005).

Besides this theoretical research on the economic effects of more central bank transparency, a wave of empirical studies used institutional indices of central bank transparency.

The transparency literature can be distinguished within five different categories: political, economic, procedural, policy, and operational transparency. Building on these five categories, the first comprehensive index for central bank transparency was constructed for the central banks of Australia, Canada, Eurozone, Japan, New Zealand, Sweden, Switzerland, the United Kingdom and the United States (Eijffinger and Geraats, 2006).

Now in the overall issue of central bank transparency, which is the role of communication? The value of communication depends on its consistency with the central bank strategy. Assuming that the public has rational expectations, any systematic pattern in the way that policy is conducted should be correctly inferred from the central bank's adopted rule in managing the monetary policy action.

Before the Crisis the more common interest rate policy was the so called Taylor Rule (Taylor 1993). Given the existence of macro targets - inflation rate and output growth - the Taylor Rule is based on the assumption that without short run shocks the nominal interest rate is equal to the sum of the real interest rate with the inflation rate – a natural interest rate, i.e. a rate at which the output growth equals its potential, without neither inflationary nor deflationary risks.

In turn the real rate of interest is defined in a medium term perspective by real drivers, i.e. the rate of saving (inter-temporal saving rate) and the rate of investment (capital marginal productivity). But short run shocks in the aggregate demand can occur, hitting the inflation rate – higher risks of today inflation/deflation – and/or the output growth – higher risks of tomorrow inflation/deflation.

Therefore the interest rate policy takes in account the shocks, reacting in a consistent way and taking into account which is the relative importance of the inflation and output growth discrepancies. In other words the nominal interest rate should be adjusted when either current inflation deviates from the inflation target or when current output growth deviates from the output target.

The Taylor Rule can be described as follows:

$$i = r + \pi + \alpha(\pi - \pi^*) + \beta(y - y^*) \text{ with } \alpha + \beta = 1$$

Where i =nominal interest rate, r = real interest rate, π =inflation rate, π^* =optimal inflation rate, y = output growth, y^* =optimal output growth, α, β = relative weights of the two macro goals.

Thus, when it comes to predicting the interest rate policy, it suffices to interpret (forecasts of) economic data in view of the central bank's policy rule; at limit there is no need for central bank communication.

Therefore we can define central bank transparency as how easily the public can know and understand the central bank strategy just from "observables". One might say that a central bank can be fully transparent without any communication. But the less is true that the monetary transparency is automatically guaranteed, the more it will be true that the design and the implementation of an effective communication policy – i.e. "discovering the observables" – becomes necessary.

4. The Second Tale, Part Two: The Emerging role of Communication

As a consequence the academic attention – as well as the sensibility of the central banker (Bini Smaghi 2007) - zoomed also on the communication policy (D'Amato et al. 2003, Blinder 2009, Neuenkirch 2011a).

Communication has developed into a key instrument in the central bankers' toolbox in recent years. Virtually all central banks in advanced economies have taken major steps in using communication as a key instrument in monetary policy-making, where usually the communication strategy is associated with the decision making process (Ehmann and Fratzscher 2005a).

The increased importance of communication for policy makers is mirrored by the rapid development of the academic literature on this topic. Researchers have highlighted at least three reasons why communication may prove useful for central banks.

Firstly, communication may be a very direct and effective tool to influence expectations (Eusepi and Preston 2007, Osterholm et al. 2008, Sturm and de Haan 2009, Drager et al. 2015). Therefore, it plays a seminal role in improving the effectiveness of monetary policy and, consequently, the economy's overall performance (Blinder et al. 2008).

Secondly monetary policy communication can be also a tool to strengthen credibility and independence (Hayo and Neuenkirch 2014), as well as conservativeness (Eijffinger et al. 2004). In fact communication may help the central bank to show how its policies are consistent with its mandate.

Finally and consequently - given the existence of the two above mentioned intertwined channels - communication may influence prices and interest rates in financial markets (Woodford 2005, Brand et al. 2006, Lucca and Trebbi 2009, Neuenkirch 2011b, Tang and Yu 2011, Beck et al. 2012, Smales 2012, Chirinko and Curran 2013, Egert and Kocenda 2013, Lamia and Sturm 2013, Kamada and Miura 2014, Carvalho et al. 2014, Hayo et al. 2014).

More transparency over policy may lead to greater predictability of central bank actions, which, in turn, reduces the uncertainty in financial markets. The ability of policy makers to influence asset prices and the predictability of policy decisions are not independent of each other as communication that leads to high predictability of decisions may also have a significant effect on financial markets.

Furthermore in the modern monetary policy theory the relevance of communication becomes even more evident if we assume: non-rational expectations, and/or asymmetric information, and/or the absence of policy rules and credibility. If one or more of these conditions hold, central bank communication may have an impact on financial markets (see also: De Haan, Eijffinger and Rybinski, 2007). The intuition is straightforward: if monetary policy discretion becomes an unpalatable quality, ambiguity is a central bank shortcoming, that has to be eliminated via effective communication policies. Therefore any kind of market imperfection reinforces the need of communication.

First, the assumption that the public will understand monetary policy perfectly regardless of the efforts that are made to explain it may be unrealistic. King (2005) poses that the public may follow simple (but possibly fairly robust) 'heuristics' in making decisions instead of following optimising behaviour. He argues that in this case central-bank communication can play an important role in leading people to choose heuristics of the right sort: "the more the central bank can do to behave in a way that makes it easy for the private sector to adopt a simple heuristic to guide expectations the better. A good heuristic from that point of view would be 'expect inflation to be equal to target' (King, 2005, p. 12).

In other words, by communicating to the public the central bank may help anchoring expectations. Bernanke (2004) refers to the recent literature on adaptive learning in explaining why communication on these issues affects monetary policy effectiveness. When the public does not know but instead must estimate the central bank's reaction function, there is no guarantee that the economy will converge to the optimal rational expectations equilibrium because the public's learning process *itself* affects the behaviour of the economy. The feedback effect of learning on the economy can lead to unstable or indeterminate outcomes. In such a setting, communication by the central bank may play a key role in helping improve economic performance.

Second, financial-market participants generally do *not* have as much information as monetary policymakers do about a number of key inputs to policymaking, including the policymakers' objectives, their assessment of the economic situation, and their policy strategy. If there is asymmetric information, i.e. if the public and the central bank dispose of different information, it is perfectly rational for the public to adjust its expectations. The central bank may, for instance, provide information about its reaction function. This should lead, *ceteris paribus*, to an increase in the private sector's ability to forecast the central bank's policy instrument. One possibility in countries without explicit inflation targets is that central bank may provide information about the long-run inflation target of the central bank.

Likewise, central banks could also provide information on the relative weights that the central bank places on its output and inflation objectives in their monetary rules. Furthermore, the central bank may have better information on the economic outlook. Kohn and Sack (2004) argue that private agents may lend special credence to the economic pronouncements of central bank, particularly if the central bank has established credibility as an effective forecaster of the economy. However, even if the central bank has private information an important issue that remains to be settled is under which circumstances release of this information may be beneficial, i.e. contributes to realizing the objective(s) of the central bank.

Finally, most central banks do not follow a fixed rule. For example, Bernanke (2004) poses that "specifying a complete and explicit policy rule, from which the central bank would never deviate under any circumstances, is impractical. The problem is that the number of contingencies to which policy might respond is effectively infinite (and, indeed, many are unforeseeable)." By commenting on recent or expected economic developments or by giving hints, the central bank may influence financial markets' expectations (see also: Siklos and Strum, 2013).

However, it is by no means clear so far what constitutes an optimal communication strategy. Any communication strategy of a central bank can produce intended and unintended effects, i.e. the consequences of the three channels already described – expectations, credibility and

macroeconomic variables – can be positive or negative. Therefore an approach of “more information is always better” is neither sufficient nor correct.

Therefore the policy of communication adopted by each central bank have to be carefully studied (Aidarova and Seyitov 2011, Garcia Herrero and Girardin 2013) by highlighting at least three different aspects.

First of all, the contents of communication must be distinguished, which can be either a quantitative (Hayo and Neuenkirch 2010) or a qualitative announcement; further the issues – macroeconomic performances, including inflation (Cihak et al. 2012) and fiscal policies (Allard et al. 2012) - or financial stability (Born et al. 2010 and 2011) – can be relevant.

Secondly, the procedures of communication must be considered (Ehmann and Sondermann 2012). These can take the form of either a press release, or of a press conference, or something else, including who is the speaker (Rozkrut 2008). Also the language can be relevant (Hansen and Mc Mahon 2015, Kawamura et al. 2016), as well as the writing (Bulir et al. 2008, Smidkova and Bulir 2008).

Thirdly, the timing of communication must be investigated (Ehmann and Fratzscher 2005b, Hu et al. 2015), at least from two points of view: in absolute terms, by distinguishing periodical, institutional communication, which is predictable, from those announcements that are not; in relative terms, with respect to the functioning of financial markets (e.g., if the announcements are communicated when markets are closed or when they are open for business).

5. Conclusion: Which Will be the “New Normal” in Communication?

At the end of our story monetary policy, central banking and communication become three corners of the same triangle: the modern central banker was essentially a monetary policy agent, primarily focused on monetary stability goals, which can be pursued by maneuvering interest rates and implementing consistent communication policy.

But now, after the Financial Crisis, the scenario is changing. The desire to avoid new cases of systemic banking instability and at the same time to address the deep economic crisis has focused new attention on both the monetary policy design and the architecture of the central bank regime.

The central bankers have extensively used their monetary policy tools both in conventional and unconventional ways, while acquiring deeper supervisory powers over banking and financial intermediaries. Monetary activism coupled with higher degree of involvement in banking supervision open again the debate on the optimal degree of central bank independence and consequently on the opportunity to reconsider the institutional setting that governs the relationships between the incumbent governments and the bureaucratic monetary policymakers. Policymakers in all countries have wondered and are still wondering whether to reshape their central bank settings, changing the degree of independence.

Just to mention the more relevant episodes, it is well known that the European Central Bank degree of freedom in defining its monetary policy stance has been several times harshly criticized by some politicians for its hawkish attitude and harshly blamed by others for its dovishness. At

the same time the European Central Bank is now deeply involved in banking supervision. Also in the United States an intense political debate originated from the monetary strategy that the Federal Reserve System designed and implemented in order to address and fix first the financial turmoil and then the economic stagnation.

Policymakers in all countries have wondered and are still wondering whether to reshape their central bank settings. New proposals to reform these systems have been enacted or are under discussion. All in all, the Crisis is challenging the consolidated central banking setting. Therefore a natural question arises: how to explain the cycles in central banking governance, i.e. the possibility that peaks and troughs can occur in the playing field of the central bankers?

A recent paper (Masciandaro and Romelli 2016) offers a framework which intertwines economics, political economy and history, using a delegation framework in which the politician's choices related to the optimal central bank design are ever conditional on the economic and institutional environment existing at a given time. Other things being equal, cycles in central bank governance are more likely to occur when the odds of macroeconomic shocks, that are politically costly and at the same time can be accommodated using the monetary tools, are higher. As in the present times.

On top of that in extraordinary times – as the years we are living are – it is more likely that psychological biases can trigger the central bank behaviour. The behavioural economics has been recently introduced in the monetary policy analysis (Favaretto and Masciandaro 2016), explaining how the loss aversion can motivate a policy inertia in taking decisions. In general it could be interesting to investigate if and how psychological biases can influence transparency and communication.

In such as situations it is evident that the central banking pillars of the monetary action must be reconsidered. But how should that be done? Is it possible to maintain the benefits of the mainstream of central banking maintaining monetary stability and also taking into account at the same time the importance of financial stability? Consequently, is it possible to reintroduce banking responsibilities into the central bank domain in a way consistent with the present institutional setting, i.e. without introducing risks of political capture and/or banking capture? Which are the consequences in shaping the communication policy? In fact the more the “observables” are in a state of flux, the more their discovery have to be carefully reconsidered.

On these questions the suggestion that can be made is that reconsidering the central banking benchmark implies a relevant risk assumption, which so far has been underestimated. How to hedge this risk is a fundamental issue that must be considered to understand not only what will be the economics of the “post-modern” monetary policy, but also which political economy drivers are motivating the demand and supply of reform of the central bank governance, including the rules of game in terms of transparency and communication.

It is true that over the past three decades central bank's approach to communication has undergone a sea change (Dale et al. 2008); at the same time we have to recognize that after the Crisis the central banks are sailing uncharted waters. Before the Crisis voice replaced secrecy; but after the Crisis which will be the “new” voice? The only (preliminary) conclusion that it can be offered is that the answer, other things being equal, will depend on how much the “new normal” in central banking will be different from the “old” one.

Needless to say that among the other things that is unlikely that will remain the same it will be crucial to explore the evolution in the information and communication technologies and policies.

6. References

- Aidarova, A. and T. Seyitov (2011), *Communication Policy of the National Bank of the Kyrgyz Republic as a Monetary Policy Element*, National Bank of the Kyrgyz Republic, Working Paper Series, n. 1.
- Alesina, A. and L.H. Summers (1993), 'Central Bank Independence and Macroeconomic Performances: Some Comparative Evidence', *Journal of Money, Credit and Banking*, 25, 151-62.
- Allard J., Catenaro M., Vidal J.P. and Wolswijk G. (2012), *Central Bank Communication on Fiscal Policy*, ECB Working Paper Series, n.1477.
- Backus D. and J. Driffill, (1985), Inflation and Reputation, *American Economic Review*, 75, 530-538.
- Barro R. and D.B. Gordon (1983) Rules, Discretion and Reputation in a Model of Monetary Policy, *Journal of Monetary Economics*, 12, 101-121.
- Beck M.K., Hayo B. and Neuenkirch M. (2012), *Central Bank Communication and Correlation between Financial Markets: Canada and the United States*, MAGKS Working Paper Series, n. 1.
- Bernanke, B. (2004), *Fedspeak*, Remarks at the Meetings of the American Economic Association, San Diego, CA, January 3rd.
- Bernanke B. and M. Gertler (1995), Inside the Black Box: The Credit Channel of Monetary Policy Transmission, *Journal of Economic Perspectives*, 9, 27-48.
- Bini Smaghi L. (2007), *The Value of Central Bank Communication*, Financial Market Speech Series, Landesbank Hessen – Thuringen, Brussel, November 20.
- Blinder, A., (2009), *Talking about Monetary Policy: The Virtues (and Vice?) of Central Bank Communication*, BIS Working Paper Series, n. 274.
- Blinder, A., Ehrmann, M., Fratzscher, M., De Haan, J. and Jansen, D.J. (2008), Central Bank Communication and Monetary Policy: A Survey of Theory and Evidence, *Journal of Economic Literature*, 46(4), 910-945.
- Born B., Ehmann M. and Fratzscher M. (2010), *Macroprudential Policy and Central Bank Communication*, CEPR Discussion Paper Series, n. 8094.
- Born B., Ehmann M. and Fratzscher M. (2011), *Central Bank Communication on Financial Stability*, ECB Working Paper Series, n.1332.

- Brand C., Buncic D. and Turunen J. (2006), *The Impact of ECB Monetary Policy Decisions and Communication on the Yield Curve*, ECB Working Paper Series, n. 657.
- Briault, C.B., Haldane, A.G. and King, M.A. (1996), *Central Bank Independence and Accountability: Theory and Evidence*, Working Paper Series, Bank of England, No. 49.
- Bulir A., Cihak M. and Smidkova K. (2008), *Writing Clearly: ECB's Monetary Policy Communication*, IMF Working Paper Series, n. 252.
- Carvalho C., Corderio F. and Vargas J., 2014, *Just Words? A Quantitative Analysis of the Communication of the Central Bank of Brazil*, mimeo.
- Chirinko R.S. and Curran C. (2013), *Greenspan Shrugs: Central Bank Communication, Formal Pronouncements and Bond Market Volatility*, Cesifo Working Paper Series, n. 4236.
- Cihak M., Jansen D.J. and Bulir A. (2012), *Clarity of Central Bank Communication on Inflation*, IMF Working Paper Series, n. 9.
- Clarida R., Gali J. and Gertler, M. (1999), The Science of Monetary Policy: A New Keynesian Perspective, *Journal of Economic Literature*, 37, 1661-1707.
- Cukierman, A. and Meltzer, A. (1986), A Theory of Ambiguity, Credibility and Inflation under Discretion and Asymmetric Information, *Econometrica*, 54(4), 1099-1128.
- Cukierman, A., Webb S.B. and Neyapti, B. (1992), Measuring the Independence of Central Banks and its Effects on Policy Outcomes, *World Bank Economic Review*, 6, 353–98.
- D'Amato J.D., Morris S. and Shin H.S. (2003), *Communication and Monetary Policy*, Cowles Foundation Discussion Paper Series, n. 1405.
- Drager L., Lamia M.J. and Pfajfar D. (2015), *Are Consumer Expectations Theory Consistent? The Role of Macroeconomic Determinants and Central Bank Communication*, CentER Discussion Paper Series, n.63.
- De Haan, J. Eijffinger, S.C.W. and Rybinski, K. (Eds.) (2007), Special Issue: Central Bank Transparency and Central Bank Communication, *European Journal of Political Economy*, 23, 1-260.
- Egert B. and Kocenda E. (2013), The Impact of Macro News and Central Bank Communication on Emerging European Forex Markets, Cesifo Working Paper Series, n. 42.88.
- Ehmann M. and Fratzscher M. (2005a), *Communication and Decision Making by Central Bank Committees: Different Strategies, Same Effectiveness?*, ECB Working Paper Series, n.488.

- Ehmann M. and Fratzscher M. (2005b), *The Timing of Central Bank Communication*, ECB Working Paper Series, n.565.
- Ehmann M. and Sondermann D. (2012), *The Reception of Public Signals in Financial Markets: What If Central Bank Communication Becomes Stale?*, ECB Working Paper Series, n.1077.
- Eijffinger, S.C.W. and Geraats, P. (2006), How Transparent Are Central Banks, *European Journal of Political Economy*, 22, 1-21.
- Eijffinger, S.C.W. and Hoeberichts, M. (1998), The Trade Off between Central Bank Independence and Conservativeness, *Oxford Economic Papers*, 50, 397-411.
- Eijffinger, S.C.W., Hoeberichts, M. and Tesfaselassie M.F. (2004), *Central Bank Communication and Output Stabilization*, CEPR Discussion Paper Series, n. 4408.
- Eijffinger, S.C.W. and Masciandaro, D. (Eds.) (2014), *Modern Monetary Policy and Central Bank Governance*, Edward Elgar Publishing Ltd., Cheltenham.
- Eusepi S. and Preston B.J. (2007), *Central Bank Communication and Expectations Stabilization*, NBER Working Paper Series, n. 13269.
- Favaretto F. and Masciandaro D. (2016), Too Little, Too Late? *Monetary Policymaking Inertia and Psychology: A Behavioral Model*, Baffi Carefin Working Paper Series, n. 17.
- Garcia Herrero A. and Girardin E. (2013), *China's Monetary Policy Communication: Money Markets not Only Listen, They Also Understand*, Hong Kong Institute for Monetary Research, Working Paper Series, n.2
- Goodfriend, M. (1986), Monetary Mistique: Secrecy and Central Banking, *Journal of Monetary Economics*, 17(1), 63-92.
- Grilli, V., Masciandaro, D. and Tabellini, G. (1991), Political and Monetary Institutions and Public Financial Policies in the Industrial Countries, *Economic Policy*, 13, 341–92.
- Hayo B., Kutan A.M. and Neuenkirch M. (2014), *The Impact of Central Bank Communication on European and Pacific Equity Markets*, MAGKS Working Paper Series, n. 27.
- Hayo B. and Neuenkirch M. (2010), *Canadian Interest Rate Setting: The Information Content of Canadian and US Central Bank Communication*, MAGKS Working Paper Series, n. 35.
- Hayo B. and Neuenkirch M. (2014), *Central Bank Communication in the Financial Crisis: Evidence from a Survey of Financial Market Participants*, Trier Research Papers in Economics, n.1.

- Hansen S. and Mc Mahon M. (2015), *Shocking Language: Understanding the Macroeconomic Effects of Central Bank Communication*, CAMA Working Paper Series, n.4.
- Henderson D.W. and McKibbin W. (1993), A Comparison of Some Basis Monetary Policy Regimes for Open Economies: Implications of Different Degrees of Instrument Adjustment and Wage Persistence, *Carnegie – Rochester Series on Public Policy*, 39, 221-317.
- Hu R., Wei Q. and Zhang Q. (2015), *The Timing of Central Bank Communication: Evidence from China*, mimeo.
- Issing, O. (2005), Communication, Transparency, Accountability: Monetary Policy in the Twenty-First Century, *Quarterly Review*, Federal Reserve Bank of Saint Louis, 87(2), 65-83.
- Kamada K. and Miura K. (2014), Confidence Erosion and Herding Behavior in Bond Markets: An Essay on Central Bank Communication Strategy, Bank of Japan Working Paper Series, n. 14.
- Kawamura K., Kobashi Y., Shizume M. and Ueda K. (2016), *Strategic Central Bank Communication: Discourse and Game – Theoretical Analyses of the Bank of Japan's Monthly Report*, CAMA Working Paper Series, n. 11.
- King, M. (2005), Monetary Policy: Practice Ahead of Theory, 2005 Mais Lecture, Cass Business School, London, May 17th.
- Kohn, D.L. and Sack, B. (2004), Central Bank Talk: Does It Matter and Why?, In: Bank of Canada (Ed.), *Macroeconomics, Monetary Policy, and Financial Stability*, Bank of Canada, Ottawa, 175-206.
- Lamia M.L. and Sturm J.E. (2013), *Interest Rate Expectations in the Media and Central Bank Communication*, KOF Working Paper Series, n.334.
- Lohmann, S. (1992), Optimal Commitment in Monetary Policy: Credibility versus Flexibility, *American Economic Review*, 82, 273-286.
- Lucca D.O. and Trebbi F. (2009), *Measuring Central Bank Communication: An Automated Approach with Application to FOMC Statements*, Chicago Booth Research Paper Series, n.34.
- Masciandaro, D., (1995), Designing a Central Bank: Social Player, Monetary Agent or Banking Agent?, *Open Economies Review*, October, vol.6, n.4.
- Masciandaro, D. and D. Romelli (2016), Ups and downs. central bank independence from the great inflation to the great recession: Theory, institutions and empirics. *Financial History Review*, forthcoming.
- McCallum, B.T. (1995), Two Fallacies Concerning Central Bank Independence, *American Economic Review*, 85(2), pp.207-211.

- Neuenkirch M. (2011a), *Managing Financial Market Expectations: The Role of Central Bank Transparency and Central Bank Communication*, MAGKS Working Paper Series, n. 28.
- Neuenkirch M. (2011b), *Monetary Policy Transmission in Vector Autoregressions: A New Approach using Central Bank Communication*, MAGKS Working Paper Series, n. 43.
- Osterholm P., Dale S. and Orphanides A., 2008, *Imperfect Central Bank Communication: Information versus Distraction*, IMF Working Paper Series, n.60.
- Persson, T. and Tabellini, G. (1993), *Designing Institutions for Monetary Stability*, *Carnegie – Rochester Series on Public Policy*, 39, 53-84.
- Posen, A. (1995), *Declaration are not Enough: Financial Sectors Sources of Central Bank Independence*, In: B. Bernanke and J. Rotemberg (Eds.), *NBER Macroeconomics Annual 1995*, The MIT Press, Cambridge MA.
- Rogoff, K. S. (1985), *The Optimal Degree of Commitment to an Intermediate Monetary Target*. *Quarterly Journal of Economics*, 100, 1169-90.
- Rozkrut M. (2008), *It's Not Only What is Said, it's Also Who the Speaker is – Evaluating the Effectiveness of Central Bank Communication*, National Bank of Poland Working Paper Series, n. 47.
- Sargent, T.J. and Wallace, N., (1981), *Some Unpleasant Monetarist Arithmetic*, *Quarterly Review*, Federal Reserve Bank of Minneapolis, Fall, 1-17.
- Siklos, P.L. and Sturm, J.-E. (Eds.) (2013), *Central Bank Communication, Decision Making, and Governance: Issues, Challenges, and Case Studies*, CESifo Seminar Series, The MIT Press, Cambridge MA.
- Smales L.A. (2012), *RBA Monetary Policy Communication: The Response of Australian Interest Rate Futures to Changes in RBA Monetary Policy*, *Pacific Basic Finance Journal*,
- Smidkova K and Bulir A. (2008), *Striving to Be “Clearly Open” and “Crystal Clear”: Monetary Policy Communication of the CNB*, IMF Working Paper Series, n. 84.
- Sturm J.E. and de Haan J., 2009, *Does Central Bank Communication Really Lead to Better Forecasts of Policy Decisions? New Evidence Based on a Taylor Rule Model for the ECB*, Cesifo Working Paper Series, n. 2760.
- Svensson, L.E.O. (1995), *Optimal Inflation Targets, “Conservative” Central Banks, and Linear Inflation Contracts*, *American Economic Review*, 87, 98-114.
- Tang M.K. and Yu X. (2011), *Communication of Central Bank Thinking and Inflation Dynamics*, IMF Working Paper Series, n.27.
- Taylor, J. B., (1993) *Discretion versus Policy Rules in Practice*, *Carnegie – Rochester Series on Public Policy*, 39, 195-214.

- Walsh, C. (1995), Optimal Contracts for Central Bankers, *American Economic Review*, 85, 150-176.
- Woodford, M. (2003), Optimal Interest Rate Smoothing, *Review of Economic Studies*, 70, 861-886.
- Woodford, M. (2005), *Central Bank Communication and Policy Effectiveness*, NBER Working Paper Series, n. 11898.