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Conférence commémorative de Tommaso Padoa-Schioppa
The Trustees de l'IFRS Foundation – Paris, February 1st 2017

Central Banking in the Crisis: Unconventional Monetary Policy and Conceptual Convergence amongst Central Banks

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I thank very much the Trustees of the IFRS Foundation and their President, Michel Prada, for their invitation.

It is a great pleasure to be in front of such a distinguished audience where I see so many friends, so many high authorities – in particular the Governor of Banque de France, the President of the ANC (Autorité des normes comptables), the President of ESMA (the European Securities and Markets Authority), the President of IASB (the International Accounting Standards Board) – so many presidents and managing directors of very important financial institutions and so many bright academics.

This pleasure is reinforced thanks to the panel discussion which you have organized on this occasion, after my speech. As chair of the Board of the Bruegel Institute, I am proud that you have asked Nicolas Véron, eminent scholar of Bruegel, to moderate the panel. Nicolas played a decisive role in producing very important analysis and proposals on banking union in particular.

Finally, I am deeply honored and very moved to deliver this Padoa-Schioppa lecture. Tommaso was such a devoted and tireless militant for the European Union and for the euro, such a close professional companion for me and a very close friend. We had many conversations on monetary policy, on the

role of Europe in the world, and more generally on the evolution of our advanced economies and political democracies. The vision of Tommaso was unique, his determination to the service of Europe was outstanding and his lucidity was impressive. I will always remember the two of us, in front of the beautiful ancient map of Europe which is in the office of the President of the ECB, reflecting on the future of our democracies and on the future of Europe in times of extremely rapid global economic changing. I will always remember his seminal remarks on his own country, Italy: "Do not trust that what happens in Italy is due to the particular idiosyncrasies of the Italian culture. Italy has always been a "laboratory" of our political democracies. We have to take very seriously, in all advanced democracies, the combination of sophisticated TV communication, nationalism and populism that we see presently in Italy!" It was many years before the Brexit and many years before the election of President Trump….

I am sure that I express the view of all participants here when I say, in front of Tommaso's brother, "*Dear Tommaso, we miss you, we miss your friendship and we miss your inspiration*".

I would like to reflect with you on central banking in the crisis. Today is nine and a half years after the start of the financial crisis, in August 2007, when the subprime market was gravely disrupted. This disruption triggered major turbulence in the functioning of money markets in all large advanced economies, with abrupt – almost overnight – very substantial increases of the Libor-Euribor-OIS (overnight index swap) spreads in major markets.

Since then, central bankers have experienced demanding and difficult times, characterized by a succession of shocks in the advanced economies that had not been seen since World War II. The successive shocks, culminating on the occasion of the bankruptcy of Lehman Brothers eight and a half years ago, were potentially more alarming than those which triggered the 1929/30 crisis in the industrialized

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economies. It is customary to speak of the global financial crisis. I also call this crisis the "advanced economies crisis" (AEC), as we have spoken in the 1980s of the Latin America crisis and in the 1990s of the Asian crisis.

I would like to present you some reflections in three dimensions of this crisis, seen within the standpoint of central banks, particularly central banks in the advanced economies. I will respond to three questions. First, what are the main reasons for the advanced economies crisis? Second, what are the main remarks one can make on unconventional monetary policies? And, third, can we really say that a number of monetary policy dimensions have converged due to the global financial crisis?

I. FIVE MAJOR REASONS FOR THE ADVANCED ECONOMIES CRISIS

I see many reasons why the financial system of the advanced economies proved as fragile as a house of cards. Without being exhaustive, I would propose five major reasons, which are mutually reinforcing:

- First, the extreme sophistication of financial instruments, the development of securitization, the generalization of derivatives markets of all kinds, the very rapid growth of shadow banking, and the emergence of highly leveraged institutions created a new financial environment that was complex, obscure in many respects, and difficult to decipher.

- Second, there was an extraordinary increase of interconnectedness between all financial and non-financial institutions, markets, and economies at national and international levels, fostered by the advances of information technologies and by globalization. This unseen level of interconnectedness has given rise to new, untested properties of global finance [Yellen 2013].

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- Third, there was a progressive generalization of a sentiment of excessive tranquillity and confidence, both in the public and the private sectors. The "great moderation," marking the period from mid-1980s to mid-2000s, gave the false impression that the low volatility of both output and inflation – in a context of steady growth and low inflation – would last for a considerably longer period of time and no longer required traditional prudent and cautious macropolicies.

  The governance of many private financial institutions was exceptionally loose, and the risk management culture was dramatically insufficient. This relative ignorance of longer-term economic and financial risks was largely shared in the public sector, including in central banking, even when the build-up of potentially deflationary and inflationary risks (because of public and private sector excessive indebtedness) was particularly accentuated [Taylor 2009].

- Fourth, closely linked with the previous reason, there was a consensus of the international community on the efficiency of markets in almost all circumstances (and therefore on the virtues of large deregulation exercises) and on the related belief that the financial system could never be far away from a Pareto-optimal single equilibrium. This implied that the possibility of multiple equilibria could be neglected. As a matter of fact, dominant macro models failed to predict the crisis and seemed, during the three quarters following Lehman Brothers bankruptcy, largely incapable of explaining what was happening to the economy in a convincing manner. As I said myself in 2011: "In the face of the crisis, we felt abandoned by conventional tools" [Trichet 2011a].

- And fifth, a generalized excess of leverage, private and public, was progressively built in the advanced economies [Kindleberger 1978; Turner 2013]. This phenomenon was almost totally neglected by the international

community over many years before the crisis, as were forgotten the financial instability hypothesis of Hyman Minsky [1986] and the debt-deflation analysis of Irving Fisher [1933]. This third reason was strongly underlined during the crisis [Reinhart and Rogoff 2009; Shirakawa 2012].

The first two reasons mentioned suggest that the important recent structural changes observed in global finance and in the global economy are presenting important new challenges, both for economic theory and for policymaking. Information technology advances, globalization, and related ongoing financial and economic interconnectedness and innovation were likely to give birth to new emerging properties of global finance that were far from being fully elucidated. The international community can perhaps be forgiven for having missed some of these new emerging properties – including the near-immediate global transmission of financial shocks – that contributed significantly to the acuteness of the crisis.

The three last reasons are less forgivable, particularly the last one: the excess of leverage. Forgetting Kindleberger, as well as Fisher and Minsky, at a time when the debt outstanding was piling up in many advanced economies, was strange. Believing that central banks should neglect an analysis of money, of its components, and of its counterparts – namely credit – as was recommended more or less by the mainstream of central banking economists appears hard to believe today with the benefit of hindsight. Displaying an excessive confidence in models that were mathematically oversimplified and ignoring the possible materializations of tail risks proved mistaken. The crisis was a cruel reminder not only of the "financial instability hypothesis" or of the "debt-deflation" analysis but also of this "Knightian uncertainty" [Knight 1921] which refuses to be encapsulated in probability modeling.

As regards the piling up of additional leverage before and after the crisis, I have to stress a fact that is frequently ignored: the total amount of global outstanding stock of debt, public and private, represented 250 percent of the

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global gross domestic product (GDP) at the end of the year 2000. At the end of the year 2007, immediately before the start of the global financial crisis, the same global debt outstanding amounted to 274 percent of the global GDP, namely an increase of 24 percentage points of global GDP in 7 years. At the time of the crisis, there was a large consensus to consider that the augmentation of global leverage was one of the major causes for the financial disruption. Therefore, it could be expected that the deleveraging would start or, at least, the pace of global leveraging would have significantly slowed down after the crisis. But it is not what happened: the piling up of global leverage continued around the same pace. From the end of 2007 to 2015 (Q2), global debt outstanding added an additional 25 percentage points of the global GDP so that it amounted to 299 percent in 2015 in comparison to 274 percent at the end of 2007[1].

It is only partially reassuring that the advanced economies have themselves reduced the speed of augmentation of their leverage: from 2000 to 2007, the augmentation of global debt outstanding was due to the advanced economies in the proportion of around 80 percent (with around 20 percent for the emerging economies). From 2007 to 2015 this proportion was reduced to around 50 percent instead of 80 percent (with also around 50 percent for the emerging economies).

As a matter of fact, the global financial crisis has triggered a very substantial growth of emerging countries debt, particularly of corporate debt which has itself been multiplied by more than 3 from 6 trillion US dollars in 2007 up to 20 trillion US dollars in 2015.

Seen from a global perspective, this is really alarming and calls for a high degree of vigilance of authorities and of the private sector at national and global levels.

[1] Special Report of the Group of 30: “Shadow Banking and Capital Markets: Risks and opportunities” – 2016.

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But before addressing what I just called the emergence of “conceptual convergence”, I would like to make some remarks on the objectives of the unconventional policies triggered by the crisis.

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II. REMARKS ON UNCONVENTIONAL MONETARY POLICIES

Today, a rapid inspection of the academic literature strongly suggests that a dominant interpretation of the unconventional monetary policies of advanced economies' central banks is that they did utilize and are utilizing unconventional instruments to pursue accommodative policies at the zero lower bound of interest rates. Therefore both interest rate policies and unconventional quantitative policies are thought to aim at the same goal: pushing down real interest rates, the unconventional policies being triggered when the zero lower bound of interest rates is attained. This entails an important consequence: the two instruments, being deemed to pursue largely the same objective, are perceived by an important proportion of market participants as very closely linked. I do not think this perception is entirely correct. And I trust that this high level of apparent correlation creates a number of unintended consequences [Issing, 2013].

As a matter of fact, unconventional monetary policies are, in my view, much more complex and multidimensional than is often understood. I propose to explore this multidimensionality first as regards the objectives pursued by unconventional policies, second as regards the large variety of different instruments that are all mentioned as unconventional and, third, as regards the possible unintended consequences of unconventional monetary policies and, more generally, of highly accommodating policies.

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1. Three objectives of unconventional quantitative monetary policies

I think it is true that one of the goals of unconventional policies is the pursuit of monetary policy accommodation at the zero lower bound. I will come back to this dimension later. But my understanding is that two other goals are worth examining. As a matter of fact, I trust that the two other objectives were exploited first, chronologically before the third became obvious. Let us examine the three objectives successively.

First, **the fight against a grave and immediate threat of collapse of the systemic functioning of the financial sphere** – As a matter of fact, at the beginning of the crisis, the central banks were suggesting a presentation of their quantitative measures that was quite different from today's dominant ones. At the time, central banks stressed they were embarking on "credit easing" (Federal Reserve) or "enhanced credit support" (European Central Bank) with a view to counter institutions and financial markets dislocations, disruptions and sudden stops.

For instance the ECB which was the first central bank to embark on unconventional measures – namely unlimited supply of liquidity on the basis of full allotment at fixed rate on August 9, 2007 – took this decision at a time when fixed rates were at the level of 4%. After Lehman Brothers bankruptcy, the unconventional monetary policy measures of different kinds decided by the ECB during the first years of the financial crisis were characterized as "enhanced credit support" (Trichet J.C. – 2009). In the case of the Euro Area, they focused primarily on banks, which were and are the main source of credit and were at the heart of the financial crisis, because, in particular, of the liquidity stress in the interbank markets. Three dimensions characterized the ECB measures:

- The liquidity management measures: fixed rate tenders with full allotment;

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enlargement of eligible collateral; lengthening of the maturities of refinancing operations LTRO – first six months, then one year (July 2009), then three years (December 2011); supply of liquidity in foreign currencies (US dollars) via swap lines with the Federal Reserve.

- The outright purchases of covered bonds (for a modest volume in comparison with the liquidity measures);
- The outright purchases of treasuries, via the Securities Market Program (SMP) program in 2010 and 2011 and the Outright Monetary Transactions (OMT) program in 2012, in order to help restore a better transmission mechanism (again for a relatively modest volume in comparison with the liquidity measures).

These measures were considered fully justified by the disruption and dislocation of the money and financial markets and the ensuing dysfunction of the monetary policy transmission channels. They were not understood nor presented as pursuing conventional monetary policy accommodation by other means at the zero lower bound from 2008 up to 2012.

In the case of the Federal Reserve System, the first non-conventional allocation of liquidity was signaled on August 10, 2007: the Federal Open Market Committee indicated that "the Federal reserve will provide reserves as necessary". It added that "in current circumstances, depository institutions may experience unusual funding needs because of dislocations in money and credit markets". At the time, the policy rate was 5.25%. On December 2011, the Term Auction Facility (TAF) was decided, together with the swap agreements with a number of central banks. The policy rate at the same time was put at the level of 4.25%. The FED took two new unconventional liquidity schemes: the Primary Dealer Credit Facility (PDCF) and the Term Securities Lending Facility (TSLF) (March 17, 2008). The next day, the policy interest rate was lowered to 2.25%.

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As we see, even before the start of the acute episode of the crisis, a large number of measures were taken to face up to dislocations and disruptions of market. These unconventional measures – full allotment of liquidity at fixed rates, long term refinancing agreements (LTRA), TAF, PDCF, and TSLF – were taken well before the zero lower bound had been reached.

After Lehman Brothers collapsed, the FED set up the AMLF, the MMIF, the CPFF and the TALF[2] from September 19 to November 25, 2008. The policy rate during this period came from 2% down to 1% until mid-December. The understanding and the presentation at the time was that the Federal Open Market Committee was running an unconventional policy of "credit easing" and not a policy of "quantitative easing". As the FED Chairman said at the time: "In particular credit spreads are much wider and credit markets more dysfunctional in the US today than was the case during the Japanese experiment with quantitative easing. To stimulate aggregate demand in the current environment, the Federal Reserve must focus its policies on reducing those spreads and improving the functioning of private credit markets more generally" (Ben Bernanke, January 13, 2009). The liquidity and securities purchases through non-conventional measures taken from August 9, 2007 up to January 2009 were mainly justified by the necessity imposed by the crisis to counter disruption and dislocation of markets, to combat the risk of sudden stops and to help restore a better functioning of the monetary policy transmission mechanism, not to engineer additional easing once the zero bound has been reached. The difference with "quantitative easing" was explicitly stressed even after the intended federal funds rate was put at the level of 0 to 0.25% (December 2008). In the same speech, in January 2009, the FED Chairman stressed that "in a pure quantitative easing regime the focus of the policy is the quantity of bank reserves, which are

[2] AMLF: Asset backed commercial paper money market mutual fund liquidity facility
MMIF: Money Market Investor Funding Facility
CPFF: Commercial Paper Funding Facility
TALF: Term Asset backed security Loan Facility

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the liabilities of the Central Bank; the composition of loans and securities on the asset side of the Central Bank's sheet is incidental".

It is visible from the explanations given by the Chairman and by the members of the Federal Open Market Committee that the qualification of "credit easing" was considered appropriate in 2009 and even in 2010, before the decision taken in November 2010 to reinforce the large scale asset purchases (LSAPs), which was christened by market participants as "Quantitative Easing 2" (QE2). The shift of the attention from the asset side of the Central Bank "credit easing" to the liability side of the Central Bank "quantitative easing" has been slow and gradual. From August 2007 up to at least November 2010, the increases of the volume of the monetary base, of the amount of reserves and of the size of the balance sheet of the Central Bank were not considered a goal in itself but a result of market's interventions.

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A provisional conclusion can be drawn from the review of the new standard measures during the first episodes of the crisis.

Major central banks had to cope with a dramatic financial crisis. They demonstrated a swift and bold capacity to face up with unprecedented challenges. At a time when the interest rates were not – not yet – at a zero level, the unconventional monetary policies were aiming not only at combating the grave and immediate threat of financial systemic disruption, but also at coping with the deficiency of financial private sector intermediation.

A second dimension of unconventional measures can be understood as central banks substituting to the private sector when private market intermediation is insufficient. I consider that it is necessary to distinguish between the first dimension which is dominant at the heat of the financial crisis, when market disruptions of various kinds and sudden stops are the main dangers, and the second dimension which is present even when there is no more immediate danger of heated financial crisis or of sudden stop of financing. Indeed in all advanced economies, the financing of the economy became suboptimal for various reasons. In the Euro Area in particular, the money market was hampered by the low level of creditworthiness of most of the commercial banks. Even after the financing of the European economy was giving signs of going progressively back to normal and various risk premia and spreads appear to be closer to what would be acceptable, the necessity of a permanent presence of the European Central Bank to substitute partially to an insufficient private intermediation was obvious. This was manifest in the successive decisions to extend the regime of "full allotment at fixed rates" which is still into force today. Another illustration of this second dimension of the non-standard measures in Europe is the program OMT, which was never activated but played and plays – as an off balance sheet commitment – a significant role in helping

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diminishing abnormal national spreads and, therefore, helping a better transmission of monetary policy decisions in all countries member of the Euro Area when the private institutions and markets would not necessarily function correctly.

In the United States, this second dimension of unconventional measures is also present. I have already quoted the Chairman of the FED mentioning, in January 2009, the necessity to focus its policies to reduce spreads and improve the functioning of private credit markets more generally. The statement of D. Kohn, Vice Chairman of the FED, at the same time in 2009, is also worth mentioning: “depending on the circumstances, declines in (banks) reserves may indicate that markets are improving, not that policy is effectively tightening”. Here we are clearly in a situation where the central bank is helping the private markets to operate more effectively. The sense of the previous remark is precisely that if private institutions and markets are demanding a lesser amount of intervention of the central bank through refinancing, or if the central bank judges that a lesser amount of its own purchases is necessary (which in both cases will turn to diminish the amount of reserves), it should be interpreted as a sign of better functioning of the private sector intermediation. It should not be understood as a sign of tightening of the monetary policy, which would be the case if the unconventional monetary policies would aim at the third goal, namely pursuing accommodating policies at the “zero lower bound”. Another striking illustration of this second dimension of the unconventional measures is the decision of the Federal Reserve to maintain the present level of securities outstanding in the balance sheet of the central bank (around 4 trillion dollars) in purchasing the equivalent of the maturities which are falling due. If this second dimension was not considered pertinent, the FED would have decided to interrupt totally its purchases of securities as soon as it had decided to start increasing rates.

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The third dimension of the non-standard measures corresponds to what I already called "the dominant interpretation" namely quantitative easing activated to pursue monetary policy accommodation at the zero lower bound. The best summing up of what I call the "third dimension" can be found Milton Friedman's answer (2000) to the question on what to do when more policy accommodation is needed at the zero interest rate level: "It is very simple. They can buy long term government securities, and they can keep buying them and providing high powered money until the high powered money starts getting the economy in an expansion".

I already mentioned that "QE" was christened by market participants themselves when the decision was taken by the FED in November 2010 to reinforce the "large scale asset purchases" – LSAPs (called QE2). At that time, the interest rates were at the level of 0% to 0,25% since December 2008.

If one concentrates on the goal to lower as much as possible the nominal and real interest rates of the economy, taking into account that the central bank has already lowered short term refinancing rates down to the zero level, the many channels that the unconventional quantitative policy measures are utilizing are in particular the following: first, lowering as much as possible the term premia of medium and long term interest rates of the benchmark yield curve through significant purchases of Treasury; second, lowering as much as possible term premia and risk premia vis-à-vis Treasuries interest rates on targeted private securities through significant private purchases; third, more generally, through the increased portfolio of central banks, push the private financial sector to invest on other asset classes which would otherwise be neglected; and, fourth, the significant increase of bank reserves would also help making sure that the large amount of liquidity in the economy (the "high powered money" mentioned by Milton Friedman) pushes down literally to the floor the short term rates, (the floor not necessarily being the main refinancing rate but the deposit rate).

Two observations are worth noting:

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- Firstly, it is important to note that the fourth channel mentioned gives a particular importance to the "deposit interest rate" (ECB) or to the interest rate on "excess reserve balance" (FED): the short term interest rates are pushed down to the level of those deposit rates by the very excess of those reserves and deposits. It is because the deposit rate in Europe is negative (- 0,40%) and not because the interest rate on the "main refinancing operation" is negative (as a matter of fact, it is at the level of 0%), that the Euro Interbank Offered Rate (EONIA) is around the level of - 0,35% (month of February 2017).
- Secondly, the level of the deposit interest rate might not only push down below zero the very short term rates, as we see in Europe, it can also play a significant role in helping decouple the unconventional quantitative measures from the zero lower bound even after an important accumulation of excess reserves ensuing a long period of QE. It suffices for the central bank to accompany the increase of the FED fund rates or of the main refinancing operation with an increase of the interest on banks deposits or excess reserves. It is what the FED has been doing since it decided to increase the FED fund rates (the last decision on December 14, 2016, put the level of FED fund rates at 0,5% to 0,75% and the interest on excess reserves at 0,75%), demonstrating that it was possible to continue to increase rates even when the amount of excess reserves are considerable. The decision to start paying interest on "depository institutions required and excess reserve balances" was taken by the Federal Reserve Board on October 6, 2008, only three weeks after the collapse of Lehman Brothers. This decision was designed to preserve the possibility of handling separately the interest rate policy and unconventional quantitative measures at a moment when unconventional measures of the quantitative "credit easing" type were generalizing, triggered by the shock of the crisis. An equivalent decision was not necessary in Europe where the deposit rate was paying interest since the

inception of the Euro.

I think it is important, from the standpoint of understanding unconventional monetary policy, to take fully into account the three goals which might be pursued by the central banks in extraordinary circumstances. Any overwhelmingly dominant understanding, or interpretation, might be misleading. In particular, what I call the present dominant interpretation – namely that these unconventional policy measures are the pursuit of monetary policy accommodation at the zero lower bound for interest rates – presents the drawback of suggesting a very high level of correlation between conventional and unconventional policy measures. In several circumstances, implementing policies on the basis of such high level correlation can be counterproductive because it would impose stickiness to decisions that might call for a large degree of flexibility of the various monetary policy measures – conventional and unconventional – independently from each other. Among such circumstances are situations where the central bank needs positive short term interest rates to solidly anchor inflation expectations whilst some markets would continue to be dysfunctional or to have an unsatisfactory functioning. This is presently the case in the U.S. where a period of interest rate increases is concomitant with the continuous reinvesting of principal payments of agencies and rolling over of maturing Treasury securities which is aiming at preserving the size of the QE portfolio in the central bank balance sheet.

Another case is when the central bank has to take into account a progressive return to a more normal functioning of financial intermediaries and financial markets, implying a better functioning of the monetary policy transmission mechanism, without necessary signaling a bias over an increase of interest rates, which would not be justified by the overall economic situation and inflationary threats. The “taper tantrum” episode starting on May 22, 2013 is an illustration of market participants behaving as if the conventional and

unconventional instruments were highly correlated which was not necessarily the intention of the central bank.

One can draw four provisional conclusions from this analysis of quantitative unconventional measures:

First, these measures stand ready to pursue three complementary but different goals:

- Countering grave and immediate threats of financial disruption and sudden stops of financing the economy;

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- Helping contribute more or less significantly to financial intermediation in times when private intermediation is hampered;
- Pursuing monetary easing at the zero lower bound.

Second, one, two or three of these goals can be pursued simultaneously depending on the circumstances.

Third, whatever main goal is pursued by the central bank, the unconventional quantitative measures have an additional impact both on the asset side and on the liability side of the balance sheet of the central bank. It would be incorrect to interpret simply the liability side as signaling "quantitative easing" and the asset side as signaling "fight against financial collapse" or "credit easing" or "enhanced credit support".

Fourth, in any case there is a price to be paid if one assumes ex ante that there is a very high degree of correlation between the conventional and the unconventional monetary policy. Such an assumption was not made when the central banks entered in the realm of unconventional measures: chronologically, they pursued successively the three goals in the order previously listed. And it looks that experience, in particular in the USA, has demonstrated that such assumption of high correlation is probably counterproductive when the time of the exit from extraordinary accommodating monetary policies comes.

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2. Unconventional monetary policies means a large number of diverse instruments that is generally communicated

Similarly to the simplification of the several goals of unconventional quantitative measures, I am struck by the fact that a quick inspection of the literature suggests, most of the time, the use of only two monetary policy instruments: on the one hand the purchase of tradable securities, public and private, and on the other hand the concept of "forward guidance".

This is not to suggest that this presentation is wrong: it is clear that it covers a very large part of unconventional measures even if a closer inspection shows many different ways of purchasing tradable securities on both sides of the Atlantic and in Japan and if forward guidance might mean several different and complex successive commitments. But if not wrong this presentation seems incomplete. I would stress in particular the importance and usefulness of the following additional measures:

First, the concept of allocating liquidity without limit ("full allotment at fixed rates" already mentioned) which has been experienced in the Euro Area on August 9, 2007, at the very beginning of the crisis, was utilized again at the end of the year 2007 and was generalized after the bankruptcy of Lehman Brothers. It is understandable that the ECB concentrated, at the very beginning of the crisis, on providing liquidity to the commercial banks which were the channel through which 75% of the financing of the European economy was operated. The logic of the choices made by the FED and the ECB at the beginning of the crisis is clear: each Central Bank concentrated on avoiding the sudden stop of the main financing channel of their respective economies, markets in the US (75% of the financing versus 25% for the banks) and commercial banks in Europe (75% of the financing versus 25% for the markets).

In both cases, the sudden stop was avoided. In the US there was a very significant over-financing of the economy through securities purchases,

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triggering a very large amount of excess reserves helping irrigating all the segments of the economy with abundant liquidities. In the Euro Area, all the commercial banks were guaranteed ex ante that they would have access to all the liquidity they would need.

What is to be particularly noted is that the ECB utilized in this occasion, for the first time, a generalized "off balance sheet" commitment: the ex ante promise of full allotment meant that the Centric Bank could supply all the liquidity required provided the commercial banks would present the equivalent amount of eligible collateral. The order of magnitude of the amount of eligible collateral being around 4 trillions euros, the volume of the off balance sheet commitment was considerable and a multiple of the liquidity which was effectively supplied.

Second, in the domain of the off balance sheet monetary policy measures, the ECB utilized another important instrument which was the Outright Monetary Transactions (OMT) already mentioned. This program deals with outright transactions in secondary, sovereign bonds markets. The activation of the program relies upon a number of conditions. First that the state concerned is supported by the support funds of the Euro Area, the European Stability Mechanism (ESM) established on September 27, 2012 which succeeded the European Financial Stability Facility (EFSF), agreed upon on May 9, 2010. Second the conditionality of the ESM support must be met at the moment of the transactions. And third, the country concerned must have regained access to long term financing but with a level of spreads which would be considered abnormally high. What is quite remarkable in the case of the OMT program is that it was never activated but proved to be effective in deterring a large proportion of the speculative part of the market from betting on the default of the vulnerable countries concerned (and possibly leaving the single currency

area as a way of consequence). As the SMP had done in 2010 and 2011, the OMT helped to improve significantly the transmission of the ECB's monetary policy to all economies member of the Euro Area. What is quite remarkable is that the ECB purchased more than 2% of the GDP of the Euro Area (more than 210 billions euros), through Greek, Irish, Portuguese, Spanish, and Italian bonds through the SMP program while there was no activation at all of the OMT program. There, with the OMT, the potential of the "off balance sheet" monetary policy measures was demonstrated in 2012 for a second time, after the commitment "full allotment at fixed rate" proved its effectiveness at the beginning of the crisis.

If there is quite often no mention of the potential importance and effectiveness of the off balance sheet monetary policy measures, there is a widespread recognition of "forward guidance" as an efficient unconventional monetary policy measure.

Third, the generalization of the concept of forward guidance – It consists in communicating in advance the forecasts of the Central Bank as regards future interest rates. Some central banks have followed this path for a number of years: the Reserve Bank of New Zealand since 1997 and the Norges Bank since 2005 (also, which is not necessarily known, Bank of Japan in 2001). In the case of the Norges Bank a confidence interval was given around the short term interest rate path. This concept of FG can be interpreted as an application of "transparency". The Central Bank communicates to the public its likely future decisions on short term interest rates, on the basis of all the information it possesses, applying its reaction function to its own perspectives of the real economy and its own present analysis of future threats to price stability. There is no intention of the Central Bank to take any new commitment in this concept of FG. The Central Bank explicitly says that it is free to change its own projections,

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on the basis of new information, to modify its analysis of the balance of risks and therefore not to stick to its previous communication, with or without confidence interval. Still it is difficult to avoid totally that market participants would consider that there is an element of implicit commitment in this communication.

Totally different is the concept of FG which is aiming at influencing deliberately the longer term rates, by promising investors and market participants a certain path for future interest rates. More particularly, when interest rates are at the zero bound, a number of economists are suggesting that the Central Bank takes a commitment to maintain a zero interest rate policy for a long period of time, even if, conditions changing, a firming of the monetary policy stance would be recommended (Krugman P., Dominguez K. and Rogoff K. –1998–) (Eggertsson G. and Woodford M. –2003–). In this understanding of FG, the element of unconditional commitment dominates. The concept was given by Paul Krugman a witty definition: "the Central Bank needs to credibly promise to be irresponsible".

Pure unconditional FG presents the merit of total clarity. The Central Bank is bound to do what it has promised. The risks taken are twofold if economic conditions change. On the one hand the Central Bank, sticking to its promise, takes the risk of unanchoring inflation expectations, with all the adverse consequences it entails in terms of credibility of the Bank and as regards medium and long term interest rates increases. On the other hand, if the Central Bank does not respect its promise and raise rates, it will be seen by market participants as not meeting its affirmed commitments and therefore not being credible in the future.

Nevertheless, in the view of the supporters of the FWG of unconditional FG, those risks are worth taking because of the extraordinary situation which

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characterized Japan in the 90's and 2000's and is characterizing all major advanced economies since the start of the global financial crisis.

The starting point before the start of the crisis was that only one among the Central Banks of the large advanced economies had adopted a kind of "targeted" FWG: Bank of Japan. Today all four large advanced economies' Central Banks are utilizing FG.

The evolution of the press releases of the FED as regards FG reflects the progressive evolution of the concept applied from 2008 (Issing O. –2013–).

FG started in the U.S. with a first statement of the FOMC in December 2008 according to which "the Committee currently anticipates that economic conditions are likely to warrant exceptionally low levels for the federal funds rate for "some time". Then from "some time" the qualification came to "an extended period" (March 2009). Much more precise time guidance was provided on August 2011, marking the shift towards a much more precise "date based FG: "at least through mid-2013. Then the end of the period was moved forward: "late 2014" (in January 2012) and "through mid 2015" (September 2012). At the end of December 2012, a very important change came. It was the shift from a date base commitment to a "targeted" FG: at least as long as the employment rate remains above 6,5%, inflation between one and two years ahead projected to be no more than a half point above the Committee's 2 percent longer run goal and longer-term inflation expectations continue to be well anchored" (FOMC statement December 2012).

These successive qualifications signal a progressive shift from a relatively vague commitment at the very beginning, to an unconditional, date based commitment –the period considered being more and more extended– and then back to a conditional commitment more precisely defined in terms of unemployment and price stability targets.

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The introduction of FWG in Europe is more recent and seems to have been in particular fostered by the will of the ECB and BOE to avoid as much as possible that the increase of US long term market rates would be transmitted to the European long term fixed interest markets.

BOE introduced a targeted FWG on August 7, 2013 with a promise to maintain rates at very low level until the unemployment rate would have fallen to a threshold of 7%. But it mentions explicitly three conditions to be also met for the commitment to hold. On top of a financial stability condition two are precising the price stability constraints: inflation 18 to 24 months ahead should not be over 2,5%; and medium term inflation expectations should remain sufficiently well anchored. The two conditions are the same as those mentioned in the previous FED communication.

The ECB has introduced FWG on July 4th, 2013. Mentioning the "key ECB interest rates to remain at present or lower levels for an extended period of time" the ECB is simultaneously communicating stability at low level as well as a downward bias which reinforces the message. The ECB insists that not only there is no change of its strategy –namely the pursuit of price stability, in line with its definition– but that its FG is a "sharp pronouncement to reassert it (Praet P. –2013–). The ECB's FG is therefore presented as a conditional forward guidance which clarifies both its assessment of the outlook and its reaction function.

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III. THE EMERGENCE OF CONCEPTUAL CONVERGENCE

Having to cope with the dramatic events occurring in the advanced economies in 2007 and 2008, central banks had the lucidity and the courage to take bold and swift decisions. They were coping with very different economies, with significantly different financial structures, and with diverse historical and cultural backgrounds and conceptual references. One could have expected that, under the pressure of their own economies' idiosyncrasies, the shock of the crisis would have accentuated their differences and given rise to an even more diverse set of decisions, of utilization of policy tools and instruments, and of concepts of monetary policy in a selfish, inward-looking mode.

My thesis is that – contrary to what could have been expected and, perhaps, feared – central banks appeared to be practically and theoretically somewhat closer when confronted by economic and financial turmoil. This phenomenon was spectacular almost immediately after the Lehman Brothers bankruptcy, with the closest central bank international cooperation ever, including through a multilateral network of swaps lines, which remains a historical accomplishment [Papadia 2013]. This unseen level of close cooperation has also been symbolically illustrated by the coordinated decrease of interest rates that took place on October 8, 2008.

The crisis has also started or accelerated a multidimensional process of convergence of key elements of thinking and making monetary policy. I already elaborated on the "unconventional" dimension of this complex "rapprochements". But the phenomenon is multidimensional. I propose to characterize this phenomenon as a process of "conceptual convergence." It is far from being achieved, if it ever can or should be. But my own perspective suggests that it is an ongoing global process that should call for great attention both from academia and from policymakers.

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On top of the unconventional monetary policy domain, I see five issues or dimensions along which, in my view, this phenomenon of "conceptual convergence" is occurring:

1. The best place for locating banking surveillance
2. The prevention of systemic risks
3. The role for money and monetary aggregates, its components and counterparts in monetary policy
4. The concept of communicating through press conferences
5. And last but not least, the definition of price stability[3]

Let us examine more closely these five dimensions.

1. The best place for locating banking surveillance

The third dimension of conceptual convergence − namely, the need for the central bank to be associated with, or in charge of, banking surveillance and macroprudentials − is also noteworthy. Fifteen years ago, there was a profound split among countries and central banks. The United Kingdom was becoming definitely hostile to the central bank's being involved in banking surveillance. The Euro Area was split between countries favoring a deep involvement of the central bank in banking surveillance and countries that were opposing such a concept. The Netherlands, France, and Italy, for example, were of the first persuasion; Germany, Belgium, Finland, of the second one. In several respects, the United States looked to be between the two schools.

[3] F. Papadia, « Central Bank Cooperation during the Great Recession » - Bruegel Policy Contribution, Issue 2013/08 (June 2013).

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Today the landscape is profoundly different. The United Kingdom got back to its previous long-standing tradition of giving key responsibilities in banking surveillance to the central bank. The Euro Area has decided to put its new "single surveillance authority" under the European Central Bank. And the United States has reformed banking surveillance in reinforcing the responsibilities of the Federal Reserve System. Today, Japan remains the sole exception.

2. The prevention of systemic risks

I will stress that all major advanced economies, without exception, consider that their central banks are institutions well placed to play an important role in the domain of the prevention of systemic risks and of macroprudential policy. Two new institutions, on both sides of the Atlantic, bear witness to this major trend:

- The Financial Stability Oversight Council established by Title 1 of the Dodd-Frank Act, signed into law on July 21, 2010, of which the chairman of the Federal Reserve is a voting member. The Federal Reserve Board has an important role to play, to the extent that the primary responsibility of the council is to identify nonbank financial firms that pose a risk and to designate them as systemically risky financial institutions. If this is the case, then the Board of Governors of the Fed subjects the institution concerned to heightened prudential oversight.

- The European Systemic Risk Board was set up slightly later, on December 16, 2010. It is chaired by the president of the ECB and is very close to the central bank, to the extent that the ECB is providing the board with analytical, statistical, administrative, and logistical support.

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It is obvious that academia had already identified the importance of the concept of systemic risk before the last global crisis. The extremely important literature on the 1929-1930 crisis and its developments bears witness to this awareness [Bernanke 2000]. The thesis that the financial sphere was systemically unstable was presented with great accuracy in the 1970s by Minsky [1977]. The functioning of markets when information is asymmetrically distributed was studied in great depth in the 1970s and 1980s [Stiglitz and Weiss 1981]. A wealth of important work on systemic risk came in the 2000s, before the crisis [Allen and Gale 2000; De Bandt and Hartmann 2000; Freixas and others 2000].

But it remains true that the dramatic unfolding of systemic financial crisis events since 2007-2008 drew new attention to the concepts of systemic risk and of macroprudential action. One of the major lessons drawn from the very beginning of the crisis was that in very highly globalized, integrated, and complex financial systems, microprudential supervision alone can no longer guarantee financial stability. There is therefore an urgent need for macroprudential supervision, aiming at detecting systemic risk and proposing remedial action. The main challenge in systemic risk analysis is to integrate all relevant perspectives on the financial sector to take a holistic view on the system, its dynamics, and its interlinkages [De Bandt and others 2009; Brunnermeier and Pedersen 2009; Trichet 2009; Boissay and Smets 2013].

I think it is remarkable that the financial crisis has not only contributed to creating a large consensus in favor of central banks' being significantly involved in banking surveillance and microprudential action but has also helped crystallize an emerging global consensus on the decisive importance of macroprudential action, where central banks are also called to play a pivotal role.

That being said, many implications of the greater role of central banks in these domains can be discussed. The micro and macro surveillance responsibilities

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should not compromise the ability of central banks to pursue their price stability mandates. One way of ensuring the integrity of monetary policy is to put the new functions very close to the central bank but not necessarily under the direct responsibility of the governing council, monetary policy council, or open market committee.

3. The role for money and monetary aggregates, its components and counterparts in monetary policy

Even though it might be still disputed, I see personally a fourth dimension of what I call "conceptual convergence": the progressive recognition that monitoring money and credit remains important in monetary policy. After years of financial crisis, so evidently triggered by the dynamics of credit to the private and public sectors – namely, the dynamics of counterparts of monetary aggregates – things have changed. The "benign neglect" of money and finance by the dominant theory in monetary economics resulted, in the advanced economies, in one of the most dramatic challenges for monetary policy in over a century. It is hard to believe, in retrospect, that the models utilized by central banks were indeed almost totally neglecting money and credit. Perhaps even more striking is the fact that those rare central banks that were giving importance – though not exclusivity – to the concept of "monetary analysis" were considered undoubtedly rearguard and obsolete! I experienced this strange period with all my colleagues in the ECB Governing Council, in particular with Otmar Issing and Jürgen Stark, before the crisis, when the ECB's monetary policy, with its "two-pillars" framework, was heavily criticized by not a small part of academia.

The observation that in the long run "inflation is always… a monetary phenomenon" – a statement that was not necessarily disputed by many

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economists, provided that “long run” would be transformed into “extremely long run” – was the main justification for the first interpretation of the monetary pillar of the ECB. At the time of its inception, empirical analysis suggested good stability of the money demand function. We recognized over the years that we could not rely on the kind of stability of money demand that had been observed in the past. We considered nevertheless – rightly so, I trust – that we had to continue to do this monetary analysis. The idea that a lot of hard work had to be done to enhance and enrich the monetary analysis was stressed, particularly the necessity of a deeper understanding of the dynamics of the major counterparts of the monetary aggregates [Papademos and Stark 2010].

So we did not say that the ECB had the best monetary policy concept one could dream of or that the two-pillar strategy did not deserve very significant improvements. On the contrary, we mentioned explicitly over the years that the ECB was very prudent and cautious in the interpretation of monetary analysis and that, in any case, we had no mechanistic instrumentation of monetary analysis (as well as of the economic analysis pillar).

But I remember vividly the skepticism I encountered when I explained that the monetary analysis pillar had been important when the ECB refused to decrease interest rates in 2004, when all governments (including Germany, France, and Italy) were asking us to do it. A similar situation occurred at the end of 2005 when international institutions, many observers, and 10 governments out of 12 were vocal in advising the central bank not to move up.

We are now in a slightly different universe. It is more accepted by academia that there is indeed information contained in money and credit dynamics that is important for monetary policy, even if this information is difficult to extract and decipher [Orphanides and Wieland 2013]. Central banks are still of quite different theoretical persuasions, despite the elements of convergence already mentioned. Some are attached to the third generation of

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"flexible inflation targeting." The Fed is applying a dual mandate enriched with explicit quantitative inflation definition and employment objectives. The ECB has its definition of price stability in the medium run, with a strategy relying on cross-checking of the economic and monetary analysis. But my understanding is that they all, without exception, would agree that the information extracted from money and credit should not be excluded a priori from their analysis. The interest in having a holistic approach, including analyzing the real economy, money, and finance is no longer denied by the dominant part of academia.

This does not mean that there is a consensus on how to extract the pertinent information from monetary and financial data and how to process this information in order to have the best informed monetary policy decisions. But it is now not really disputed, after the hard lessons learned from the crisis, that monetary dynamics might supply important information on asset price developments [Alessi and Detken 2009; Meltzer 2013]. I see also a growing consensus on the necessity of a thorough analysis of money and credit in order to facilitate the best contribution possible of the central bank to preserving financial stability: a holistic strategy contributes to protecting monetary policy from becoming in contradiction with the goal of maintaining price stability [Issing 2003].

I cannot embark here on a full-fledged discussion of the "leaning against the wind" policy approach, but it seems to me that the information contained in the dynamics of private and public credit are in the longer run very important to private and public financial stability, namely to potential deflationary and inflationary risks, which are at the heart of monetary policy [Brunnermeier and Sannikov 2012].

4. The concept of communicating through press conferences

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As regards the improvement in communication through the generalization of press conferences, the convergence took also some time. But it has also been spectacular, with the first Fed chairperson conferences starting in April 2011. It is not surprising that such communication tools have become general among major central banks. The absence of immediate real-time explanations, which was the rule in the 1990s, was often triggering several − and sometimes contradictory − interpretations of the decisions of the central banks, creating unwelcome market volatility. It also could happen, fortunately rather exceptionally, that the interpretation of the majority of market participants was not in line with the intention of the monetary policy decision makers.

From that standpoint, it is not surprising that the need for such press conferences appeared necessary in the case of the ECB: there was a need to ensure clarity and absence of ambiguity in the new central bank communication. This was made more complex because, from the inception of the central bank, 11 countries, with their different cultures, public opinions, and languages, were part of the Euro Area. The need for avoiding diverging messages and interpretations was particularly acute in a central bank issuing a currency for many countries. Finally, it appeared that the real-time communication that was necessary in the Euro Area since its inception was also found to be extremely useful in the very difficult and demanding financial turbulences triggered by the crisis − even in an established political federation like the United States or in centralized nations like Japan and the United Kingdom.

5. The definition of price stability

As regards the definition of price stability, or the level of an inflation target, 15 years ago, only two central banks among the four major central banks of the advanced economies were mentioning a precise definition or target: the

European Central Bank (ECB) and the Bank of England (BOE). Both mentioned the 2 percent figure on CPI. For the ECB, it was "less than 2 percent" since its inception in 1998 − clarified as "less than 2 percent, but close to 2 percent" on May 8, 2003. For the BOE, it was "2 percent on CPI" since 2003. At that time, neither the U.S. Federal Reserve Board (Fed) nor the Bank of Japan (BOJ) were signaling their price stability definition or target. Since the decision of the Fed in 2012 and the statement of the BOJ on April 4, 2013, all four now mention the 2 percent figure, which has become a global benchmark among all the large advanced economies.[4]

It is important to note that this convergence is recent – 2013 for Japan and 2012 for the Fed. The Federal Open Market Committee "Statement on Longer-Run Goals and Policy Strategy" published in January 2012 reads: "The inflation rate over the longer run is primarily determined by monetary policy and hence the Committee has the ability to specify a longer run goal for inflation. The Committee judges that inflation at the rate of 2 percent… is most consistent over the longer run with the Federal Reserve's statutory mandate".

Moreover, this convergence does not mean that the concepts of monetary policy are identical. Among the four, some central banks are theoretically remaining or becoming inflation targeters, even if the introduction of medium- and long-term considerations has considerably transformed the BOE's initial concept of "pure inflation targeting" [King 2012]. Others are explicitly or implicitly mentioning that they do not have an inflation target but a "definition of price stability" (the ECB and, to some extent, the Fed). The crisis, since 2007-2008, has driven central banks to pay considerable attention to growth and job

[4] The BOJ statement reads: "The Bank will achieve the price stability target of 2 percent... at the earliest possible time, with a time horizon of about two years." The Federal Open Market Committee "Statement on Longer-Run Goals and Policy Strategy" published in January 2012 reads: "The inflation rate over the longer run is primarily determined by monetary policy and hence the Committee has the ability to specify a longer run goal for inflation. The Committee judges that inflation at the rate of 2 percent … is most consistent over the longer run with the Federal Reserve's statutory mandate."

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creation and to financial stability, which for some of them, such as the Fed and the BOJ, is a statutory or de facto "dual mandate." At the same time, in my understanding, all consider medium/long-term price stability as one of the necessary conditions for sustainable growth and financial stability [Draghi 2013].

This remarkable convergence, which took place in a relatively short span of time, should not be underestimated. Particularly striking is the fact that all central banks concerned have stressed the importance of solidly anchoring inflation expectations over the medium and long run. It is precisely this major goal of anchoring inflation expectations that has been the main driver for central banks to indicate precise targets or a precise definition of price stability. The central banks of all major advanced economies, issuing the four major convertible currencies, namely the four currencies of the present weighted currency basket of the special drawing right (SDR), are all publicly committed to solidly anchoring inflation expectations at or close to 2 percent in the medium and long run. They have all confirmed this commitment in statements made public in the present very demanding circumstances. *We have now an affirmed inflation global nominal anchor for the first time since the dismantling of the Bretton Woods system.*

It would be naïve to say that an inflation consensus is *per se* an effective global game changer. But it is, in my view, one of the necessary conditions for engineering more stability in the international monetary system.

I would not totally exclude that this convergence played a role in the apparent paradox that the only segment of the financial markets that has not been hit by major dramatic disruptions since the start of this financial crisis is the exchange markets among major convertible currencies.

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