

MONETARY POLICY MONITOR

- **THE FED AT THE CROSSROADS: THE EXIT STRATEGY AND POLICY IMPLEMENTATION**

- **CONVERSATION WITH WILLIAM WHITE**

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Introduction

■ Loss of liquidity of mortgage-related assets is generally viewed as the starting point of the Great Financial Crisis (GFC). The first objective sign of a financial problem was given by BNP Paribas, a large French bank, which, in the first days of August 2007 announced that withdrawals from three of its subprime mortgage funds were being halted. From that point onward, fund shares could no longer be exchanged into cash. The reason was the complete loss of liquidity in the market segments for the securities held in the portfolio of those funds, making it impossible to price the corresponding assets.

The episode spooked investors in general, in a large number of economies. They had no means to know who else faced similar problems. Confidence on counterparties was badly shaken. Interbank lending rates rose considerably.

In a situation like this, investors and other financial market participants increase their demand for cash. In particular, banks and asset managers want to be comfortably liquid in order to be able to face an increased demand for withdrawals from clients. In a general way, they avoid risky positions.

A rush for liquidity requires the action of central banks. This is one of the reasons why they exist in the first place. If not contained, a liquidity crisis can badly affect even healthy financial institutions, leading them to insolvency.

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As things evolved, it became clear that the situation was a lot more serious than originally thought – the liquidity squeeze was only part of a much bigger problem. As a result, the reaction of government authorities, particularly central bankers, was much broader than the usual response to a pure liquidity problem.

Policy measures taken in different countries were mostly in the right direction and effective. The deterioration of the macroeconomic scenario which resulted from the financial crisis was so huge that it could have ended in another Great Depression. Avoiding this was probably the major achievement of the government authorities.

Nevertheless, more than eight years after the beginning of the financial crisis, a large part of the developed world has yet to recover from the excesses of the pre-crisis period and the financial shock. Perhaps the most solid performance so far has been that of the US economy, a fact which is reflected in the strength of its currency in international markets.

The recovery in the US has allowed the retirement of a large number of measures and instruments the authorities had resorted to. But full policy normalization is still far away.

At this stage, and as far as the US is concerned, getting back to normalcy basically means removing monetary policy accommodation. More specifically, it means reducing the size of the Fed's balance sheet and removing the nominal policy rate from its extremely low level. The Fed has already defined his exit strategy principles and established that the priority is to get off the zero lower bound for interest rates. Notice, however, that the situation has no precedent, since the policymakers will start raising the policy rate in the presence of a huge volume of excess reserves, this being the main reason why defining an exit strategy became necessary. In any case, the timing for the first movement is still uncertain and so is the speed of the normalization process.

The objective of this essay is to discuss the issues involved in this process. We start by reviewing the measures taken by the Fed and other government authorities during the acute phase of the financial crisis. We proceed next to a discussion of the Fed's asset purchase program, its rationale and its impact on the Bank's balance sheet. In the following section we present a quick analysis of the working of the federal funds

market, calling attention for what changed as a result of the crisis and the policy responses. Finally, after going through the exit strategy principles, we discuss issues related to policy implementation, emphasizing the choices and challenges faced by the Fed.

Extraordinary Measures for Extraordinary Circumstances

As the crisis evolved, funding their dollar books became a major problem for banks in several countries. In December 2007, in response to market pressures, the Federal Open Market Committee (Fomc) authorized dollar liquidity swap lines with some foreign central banks (14 altogether). Those lines allowed the foreign monetary authorities to assist banks in their jurisdictions. The Central Bank Liquidity Swaps mechanism (CBLS) involved two transactions. First, as the foreign central bank draws on its swap line, it sells a specified amount of its currency to the Fed, in exchange for dollars at the prevailing market exchange rate. Second, the two parties agree on another transaction, according to which the foreign central bank buys back its currency on a future date at the same exchange rate. In the end, the foreign authority pays the Fed a market rate of interest. The maturity of the lines ranged from overnight to three months.

At the same time, banks in the US were clearly in need of support from the Fed. Although there was a vast amount of liquidity available to depository institutions through the traditional discount window, banks were reluctant to demand direct loans from the authority. Such a reluctance stemmed from the fact that resorting to a central bank's line of credit is traditionally seen as a sign of fragility. To overcome this stigma, the Fed decided to establish the Term Auction Facility (TAF), through which the Fed would auction 28-day loans (later extended to 84 days) to interested parties. For banks, this avoided the need to directly request central bank's support. TAF was also approved in December 2007.

On March 11, 2008, the Fed announced another mechanism, the Term Securities Lending Facilities (TSLF). According to the new program, the Fed would lend Treasury securities to primary dealers secured by a pledge of other securities.

Securities would be available through weekly auctions. Since government securities can be converted into cash in seconds, the mechanism represented a great help to those willing to obtain cash.

It is well-known that prior to the crisis investors and financial institutions went well beyond prudent levels of risk exposure. Many institutions were running their books practically unchecked. This was particularly true in the investment bank industry, where the five most important firms had chosen an operational model characterized by very high leverage and significantly mismatched books - they were all dependent on short-term money (basically overnight), obtainable on the repo market. In addition, they were all deeply involved with mortgage-related securities and some of them used to carry huge positions in those assets.

The operational model adopted by those firms proved to be a very unfortunate choice. They all became quite vulnerable to a liquidity crisis like the one that erupted in the second semester of 2007. Pressure started to mount on those firms.

In March 2008, as the situation became critical for Bear Stearns, the Fed decided to rescue it, bailing out its creditors. Perhaps Bear was not properly “too big to fail”, but it was judged to be “too interconnected to fail”. Supported by the Treasury, and based on the now famous section 13 (3) of the Federal Reserve Act, which allowed the Board of Governors, in “unusual and exigent circumstances”, to authorize any Federal Reserve bank to extend credit to individuals, partnerships and corporations, the Fed mobilized approximately US\$ 29 billion to facilitate the absorption of Bear Stearns by JP Morgan Chase, apparently the only feasible buyer. The amount corresponded to the value of a portfolio of mortgage-related assets owned by Bear that Morgan refused to take as part of the deal. To make the transaction possible, the Fed had to set up a special purpose vehicle and lent the money to it, through the Federal Reserve Bank of New York. The vehicle, named Maiden Lane, then acquired the assets.

The acquisition of Bear Stearns by JP Morgan Chase was announced on a Sunday, in mid-March, the same day the Fed created another lending facility, the Primary Dealer Lending Facility (PDLF), a mechanism which facilitated lending to security firms like Bear. The remaining independent investment banks could now count on direct financial assistance from the Fed, in case they needed it.

In September 2008, in conjunction with the Treasury, the Fed took two quite controversial decisions. The first was to allow Lehman Brothers – an almost 160-year-old independent investment bank, to which market attention had turned after the Bear bailout – to fail. It is not clear why the Fed (and the Treasury) rescued Bear but did not do the same with Lehman six months later. Independently from the reasons, the fact is that Lehman collapsed in mid-September, becoming the major reference point of the entire Great Financial Crisis. The episode amplified the global dimension of the crisis.

Under market pressure, and just prior to the collapse of Lehman, Merrill Lynch was acquired by Bank of America. And one week after that collapse, Morgan Stanley and Goldman Sachs applied to the Fed to become bank holding companies, thus qualifying for the Fed's assistance, in case it was needed. With the quick approval of those applications, none of the five major independent investment banks was left by the end of September 2008.

The second controversial decision relates to the rescue of AIG, a giant insurance company highly exposed to risk on derivatives markets and that was on the verge of collapsing. The company's potential failure clearly posed significant systemic risk. AIG was not regulated or supervised by the central bank. To support the company the Fed had to once again resort to section 13 (3) of the Federal Reserve Act.

Initially, the Federal Reserve Bank of New York extended a line of credit to AIG for US\$ 85 billion. As collateral on the loan, the Fed took a 79.9 percent interest in the company, which in essence meant its nationalization – as explained by Alan Blinder, holding the ownership below 80 percent formally preserved AIG's existence as a private company with one major shareholder. (Blinder 2013, p. 136). The revolving credit facility was established to assist the firm in adjusting its balance sheet. The program was later modified with the use of funds from the Troubled Assets Relief Program (TARP), a procedure which allowed for the gradual decline of the Fed's credit exposure. By March 2009, the Fed and the Treasury had lent more than US\$ 180 billion to the company, leaving taxpayers at risk for an enormous sum. Once again those bailed out were the creditors and counterparties of the troubled firm.

At some point the Secretary of the Treasury and the Chairman of Fed realized that they needed more powerful instruments. The proposal they took to Congress involved the setting up of a program to buy toxic assets. Originally rejected, the Troubled Assets Relief Program (TARP) was approved a few days later (and under heavy market pressure) as part of the Emergency Economic Stabilization Act of 2008, on October 3. According to Blinder, Congress “voted to inject capital into banks while thinking it was voting to purchase ‘troubled assets’, including lots of home mortgages.” (Blinder 2013, p. 193).

Blinder has also noted that nowhere in the act “there is a single word about using TARP money to inject capital into banks”. (Blinder 2013, p. 192). But this is exactly what was done with TARP money, particularly in the beginning. At a later point, asset guarantees were offered to save two big banks, namely Citibank and Bank of America. The auto-industry benefited from the program as well. And, as already mentioned, TARP funds were also used to expand the support given to AIG, while at the same time allowing the Fed to reduce its exposure to the company. At no point in time TARP’s outstanding position was significantly higher than half the total amount of US\$ 700 billion originally approved by Congress.

After the collapse of Lehman, the Fed became convinced that actions focused on the problems of specific institutions should be supplemented by policies geared to the support of some entire segments of the financial market, like the money market mutual funds and the commercial paper industries.

The new approach came in the wake of what occurred with the Reserve Primary Fund, a major player in the money market mutual fund industry. In its portfolio, that fund had commercial papers (CPs) issued by Lehman, which completely lost their value after the bank’s collapse. This caused what is known as the “breaking of the buck”, that is, fund shares became worth less than one dollar, something in principle unconceivable for that type of fund. Shares in that industry had always been viewed by investors as very safe and liquid financial assets, just like checking accounts. On the asset side of that type of fund there are usually T-bills and other (safe) short-term financial instruments, particularly commercial papers. Given the soundness and liquidity of those assets, no one expected to make a loss in that type of investment.

Money market mutual funds are like checking accounts but they are not formally insured. Thus, when Reserve Primary Fund shares were traded three cents below the dollar, investors rushed to redeem their investments. The commercial paper market got under pressure. The public's increased demand for redemptions had turned the money market funds into heavy sellers of CPs, affecting the capacity of the issuers of that instrument to obtain short-term financing.

In an attempt to put an end to that run, the Fed established the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF), a mechanism through which the Fed would lend money (at favorable terms) to banks willing to acquire high-quality CPs from money market mutual funds. Loans were to be made against good collaterals (the CPs themselves) and were designed to be of the nonrecourse type, meaning that the Fed would keep all the downside risks of the transactions, that is, borrowers had the option to surrender the collateral in fulfillment of their obligations. In less than a week, AMLF was up and running.

But there was need for more action. As we entered into October, the market for asset-backed commercial papers (ABCP) - of fundamental importance in the financing of automobiles and student programs - was under heavy pressure. Once again, the Board of the Fed invoked section 13 (3) and decided to create the Commercial Paper Funding Facility (CPFF), a program through which the Fed would buy asset-backed commercial papers, using a vehicle especially set for that purpose (SPV). The Fed was now giving support to a large number of nonfinancial companies, issuers of ABCPs.

For a global crisis, nothing more appropriate than a multinational response. In a rare example of global economic policymaking, the ministers of finance of the G-7, who had gotten together in Washington DC for the IMF-World Bank annual meetings, decided to take responsibility for solving the financial crisis and to indicate that they would do whatever it took to save the financial system. Additional failure of systemically important financial institutions would be prevented. These were the messages contained in a joint communiqué of the G-7, issued on October 10, 2008. "In brief - wrote Martin Wolf -, no more Lehmans. Governments had socialized the

liabilities of the core institutions of the global financial system. These businesses were now wards of the state". (Wolf 2014, p. 28).

In the US, as part of the coordinated response by the government authorities to the financial crisis and the freezing of credit markets, the FDIC implemented a mechanism called Temporary Liquidity Guarantee Program (TLGP). For a fee, the guarantees usually offered to bank deposits by the FDIC were being extended to cover all marketable forms of debt. The basic idea was to reduce the cost of funding so that bank lending would normalize.

In a couple of isolated transactions, the government offered to protect large portions of the assets of two specific banks, namely Citibank and Bank of America. Blinder says that the Treasury, the Fed and the FDIC teamed up to accept or insure mountains of assets from those two banks, with the Fed taking them as collateral for nonrecourse loans. That meant that the Fed half-owned them, by keeping only the downside risk.

In November 2008, the Fed announced the creation of the Term Asset-Backed Securities Loan Facility (TALF) under the already mentioned section 13 (3) of the Federal Reserve Act. Through this mechanism the Federal Reserve Bank of New York would lend money (with terms of up to five years) to holders of eligible asset-backed securities (ABS). By facilitating the issuance of ABSs collateralized by different types of loans, the program would represent an important support to several segments of the credit market, like student loans, auto loans, credit card loans, etc. The loans provided through TALF were of the non-recourse type, meaning that borrowers could fulfill their obligations to repay the loans by simply surrendering the collateral. During the year of 2009 several modifications to the program were made, especially in regard to the set of eligible collaterals for TALF loans.

The New Liquidity Facilities and the Fed's Balance Sheet

The liquidity facilities discussed in the preceding section were thought to minimize the disruption of credit markets in general. The liquidity squeeze was putting at risk the solvency of healthy institutions and threatening the very existence of some important financial market segments. Of course, the biggest threat was to economic

activity and the labor market at large, whose prospects had deteriorated quite fast. No small task, indeed.

In a way, it can be said that liquidity-providing measures are defensive in nature. Since the counterparty of any central bank transaction is always a member of the banking system, when liquidity is provided, the central bank's total assets go up and reserves expand.

The liquidity facilities created by the Fed produced a tremendous impact on its balance sheet. Table 1 presents the maximum outstanding balances of each program and the respective dates in which they were reached. The programs are listed according to the chronological order in which they were implemented. The Central Bank Liquidity Swaps, for example, reached a maximum value of US\$ 583 billion, on October 12, 2008. The Term Auction Facility reached a peak value of US\$ 493 billion, on April 3, 2009. And so on and so forth.

Table 1: Peak values reached by the liquidity facilities, in chronological order of implementation

program	date of the peak	value of the peak (in US\$ billion)
CBLS	12/10/08	583
TAF	03/04/09	493
PDLF	10/01/08	148
AMLF	10/08/08	146
CPFF	01/21/09	350
TALF	03/17/10	48

Note: CBLS = Central Bank Liquidity Swaps; TAF = Term Auction Facility; PDLF = Primary Dealer Lending Facility; AMLF = Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility; CPFF = Commercial Paper Funding Facility; TALF = Term Asset-Backed Securities Loan Facility. Source: Fed.

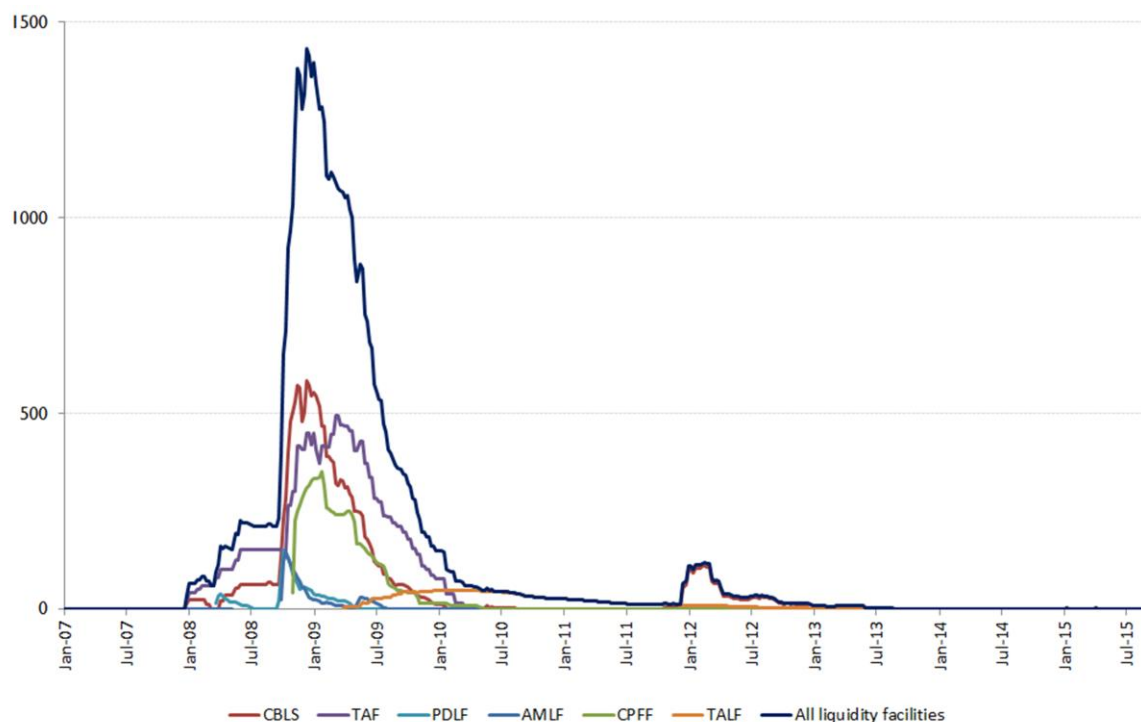
The Term Securities Lending Facility did not affect the size of the Fed's balance sheet, since it involved only a swap of Treasury bills for other securities held by the

primary dealers. Notice that table 1 does not include the approximately US\$ 29 billion lent by the Fed to Bear Stearns, nor the support the Fed gave to AIG.

One important aspect of liquidity facilities is that the resulting expansion of reserve balances tends to be automatically reversed as financial conditions improve, there being no reason to be particularly concerned with the end of such programs.

The total size of operations conducted under the above-mentioned facilities skyrocketed in the course of the year 2008, particularly after the Lehman shock. From practically zero in the beginning of that year, they reached about US\$ 1.5 trillion in December. As shown in graph 1, taken together, reserve balances associated with liquidity facilities diminished rather fast in the following year or so - by early 2010 they were already back to their original volume. The liquidity crisis did not last too long.

Graph 1: Impact of the liquidity facilities on the Fed's Balance Sheet (in US\$ billion)



Note: monthly data. CBL = Central Bank Liquidity Swaps; TAF = Term Auction Facility; PDLF = Primary Dealer Lending Facility; AMLF = Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility; CPFF = Commercial Paper Funding Facility; TALF = Term Asset-Backed Securities Loan Facility. All liquidity facilities is the sum of the above listed programs. Source: Fed.

Quantitative Easing in the US

In an attempt to offset the impact of the crisis on credit conditions and the economy as a whole, the Federal Open Market Committee (Fomc) started to ease monetary policy in September 2007, shortly after the crisis began. The strong deterioration of economic and financial conditions in the final part of 2008 led the monetary authorities in the US to proceed with the easing cycle until the nominal policy rate was eventually brought down to almost zero. The final step was taken in the December 15-16 meeting, in which the policymakers adopted a target range (0 to ¼ percent) rather than a target point for the federal funds rate. The minutes of the meeting explained that such a decision had to do with the fact that “the large amount of excess reserves in the system would limit the Federal Reserve’s control over the federal funds rate”. In addition, the Committee wished “to communicate explicitly that it wanted federal funds to trade at very low rates”. From that point onward, the authorities could no longer make use of conventional monetary policy to stimulate the economy.

Unable to further reduce the policy rate, the Fomc began to provide forward guidance about the likely path of the federal funds rate and resorted to the purchase of financial assets in the secondary market. As to this second type of unconventional measure, in November 2008 the Fomc announced plans to acquire up to US\$ 100 billion in debt instruments issued by government sponsored enterprises (GSE) and up to US\$ 500 billion in GSE mortgage-backed securities over the course of a few quarters. It was the first phase of a series of large-scale asset purchase programs (LSAPs). Over time, the overall program augmented considerably and was expanded to include long-term Treasury securities.

The program lasted from November 2008 to October 2014. During that period, the Fed acquired around US\$ 1.7 trillion in Treasury securities, about US\$ 2 trillion in agency mortgage-backed securities (MBS) and approximately US\$ 170 billion in debt issued or guaranteed by government agencies. (Ihrig-Meade-Weinbach 2015, pp. 8-9). In 2012, at the traditional symposium held annually in Jackson Hole, the then chairman Bernanke explained that the Committee had embarked on that path based on

“some general principles and some insightful academic work but – with the important exception of the Japanese case – limited historical experience”. (Bernanke 2012, p. 3). At the occasion, he gave a sort of an official rationale for that type of policy. Financial asset purchases are believed to affect the economy through the so-called portfolio balance channel, which is based on the ideas of monetary economists like Tobin, Friedman and others, he said. The key premise here is that different classes of financial assets are not perfect substitutes in investors’ portfolios.

In Bernanke’s own words, “imperfect substitutability of assets implies that changes in the supplies of various assets available to private investors may affect the prices and yields of those assets. Thus, Federal Reserve purchases of mortgage-backed securities (MBS), for example, should raise the prices and lower the yields of those securities; moreover, as investors rebalance their portfolios by replacing the MBS sold to the Federal Reserve with other assets, the prices of the assets they buy should rise and their yields decline as well. Declining yields and rising asset prices ease overall financial conditions and stimulate economic activity through channels similar to those for conventional monetary policy”. (Bernanke 2012, p. 4).

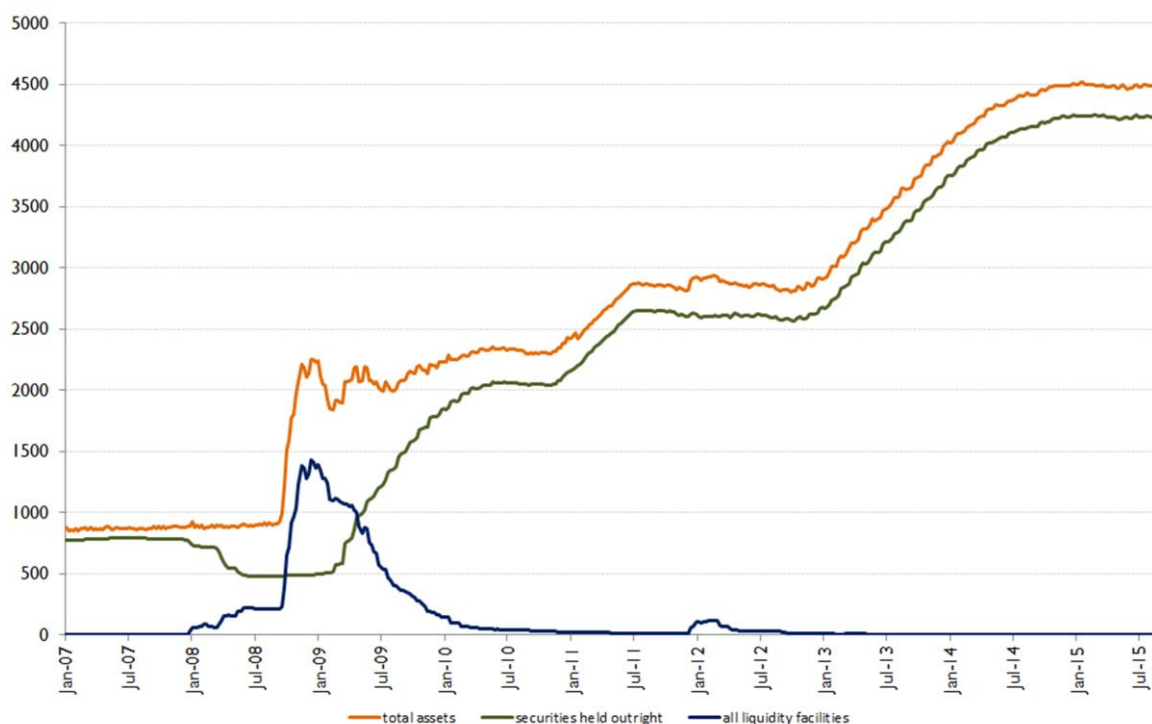
Two other mechanisms were mentioned as justification for LSAPs. One has to do with signaling, which refers to the impact of the policy on investors’ expectations regarding the future path of the federal funds rate. The other regarded the possibility of asset purchases improving the functioning of some segments of the financial markets, thereby easing credit conditions in those segments. (Bernanke 2012, p. 5).

Thus, according to the theoretical framework on which the policy was based, for the effects on yields to last, the Fed needed to hold on to the acquired securities. And this is what explains the policy of reinvesting principal payments on agency debt and agency MBS and of rolling over Treasury papers as they mature.

According to the most recent available data, total securities held by the Fed amounted to about US\$ 4.2 trillion in August 2015. On the liability side of the Fed’s balance sheet, the volume of reserves was approximately US\$ 2.6 trillion, a huge increase from about US\$ 45 billion observed before the crisis. Currency was the second most important item on that liability side, amounting to about US\$ 1.4 trillion.

As to the aggregate size of the Fed’s balance sheet, its first major upward movement resulted from the liquidity operations examined earlier. As we entered into 2009, the Fed’s total assets had gone up to about US\$ 2.1 trillion, a huge increase from its pre-crisis level of approximately US\$ 870 billion. With the introduction of the asset purchase programs, along 2009, total assets oscillated within a relatively narrow range, since the impact of those programs was somehow neutralized by the declining trend in the outstanding volume of the liquidity facilities. From 2010 onward, however, LSAPs became the dominant force, and total assets reached US\$ 4.5 trillion in late 2014. (Graph 2).

Graph 2: The changing composition of the Fed’s total assets (in US\$ billion)



Note: weekly data. Source: Fed.

The Federal Funds Market

At this point it is worth recalling the basic functioning of the federal funds market and to make clear the main differences between two situations, namely, those prevailing before and after the financial crisis, the last one being characterized by nominal policy interest rate at the zero lower bound. It seems equally convenient to indicate what will change when monetary policy normalization begins.

In the federal funds market, depository institutions and certain eligible entities lend money to each other on a daily basis, at an interest rate known as the federal funds rate. Loans are made on an unsecured basis. Prior to the financial crisis, transactions in that market were generally driven by two major forces, namely, the demand for reserves by banks to meet requirements determined by the Federal Reserve (many banks are able to satisfy their entire requirements with vault cash, but many others need to maintain reserve balances at the Fed to fulfill their obligations) and the desire to keep reserves at the legal minimum levels, since idle resources maintained at the central bank used to earn no interest. (Ihrig-Meade-Weinbach 2015, pp. 3-4).

Under those circumstances, bank reserves were relatively scarce and monetary policy was conducted without any significant complexity. Fomc members determined the target level for the federal funds rate (the policy rate), leaving to the Open Market Trading Desk at the Federal Reserve Bank of New York the job of adjusting the level of reserves in the system in such a way as to guarantee that the fed funds target rate was effectively met. The traditional adjustment process involved buying or selling securities, when disequilibria were judged to be of a permanent nature, and lending or borrowing funds on collateralized transactions (repurchase and reverse repurchase agreements), when deviations were viewed as temporary. If a sound bank needed official assistance, borrowing from the central bank would involve a rate of interest higher than the policy rate, called primary credit rate.

This picture changed with the emergence of the financial crisis. And the main novelty was the movement from a situation of relatively scarce bank reserves to one of abundance. As mentioned above, at some point during 2008 the extraordinary level of reserves in the system started making the job of the Open Market Trading Desk more

difficult. As discussed below, authorization for the Fed to pay interest on reserves reinforced the power of the Desk to control the level of the federal funds rate. Interest can be paid both on reserve balances maintained to meet official requirements as well on excess reserves (IOER). Although the rates are presently the same, they can be set at different levels.

The important point is that IOER defined a ceiling for the federal funds rate - the primary credit rate is set above IOER, but that has to do with a different matter, namely official financial assistance. In order to understand why the fed funds rate is negotiated below IOER, we need to recall what else changed after the crisis. As the Fed's balance sheet increased dramatically since late 2008, so did the volume of excess reserves. And this reduced considerably the need for depository institutions to borrow funds to meet reserve requirements and clear financial transactions. (Ihrig-Meade-Weinbach 2015, pp. 9-10). Apparently, borrowing activity is presently dominated by depository institutions of bank holding companies and foreign banking organizations. (Afonso-Entz-LeSueur, 2013b).

On the lending side, given the payment of IOER, banks have no incentive to lend money at any rate below that. The major sellers of fed funds are institutions not eligible for IOER on the balances they keep at the Fed, like government-sponsored enterprises (GSEs), particularly the regional cooperative banks which integrate the Federal Home Loan Bank System (FHLB).

Thus, while certain institutions have an incentive to lend reserves at any positive rate, others have an incentive to purchase federal funds at rates below IOER in order to benefit from the spread between the market rate at which they buy funds and the rate they receive from the Fed (IOER). Due to this arbitrage opportunity that spread usually does not widen beyond a certain point.

In sum, measures taken in response to the crisis created a band within which the fed funds rate fluctuates. IOER became the band's ceiling and zero became the floor. Notice that the combination of the above-mentioned factors considerably reduced the trading volume in the fed funds market. (Afonso-Entz-LeSueur, 2013a).

Going back to monetary policy normality certainly means reducing the size of the Fed's balance sheet and removing the nominal policy rate from its extremely low

level. How should the Fed initiate that process? How should it proceed? Apparently, the so-called exit strategy has already been defined.

Exit Strategy Principles

The less traditional measures undertaken by the monetary authorities became a source of concern right from the beginning. While some feared that the huge monetary expansion associated with the acquisition of financial assets would be inflationary, others were more concerned with possible difficulties involved in the process of going back to normalcy in regard to the conduction of monetary policy. There were also those concerned with the possibility that stimulus in excess might take us back to financial instability.

Discussions on the subject were generally held based on the quite realistic assumption that economic conditions would probably require removing the basic interest rate from near-zero levels long before the elimination of excess bank reserves. Doubts were raised (and they still are) whether such a task could be accomplished in a proper and timely manner.

The fact that former chairman Bernanke felt compelled to indicate, just a few months after the launching of the asset purchase program, that he did not foresee any major obstacle to reverse the strategy when the appropriate time came is in itself a sign of the discomfort provoked by the initiative.

In an article published by The Wall Street Journal on July 21, 2009, Bernanke assured that the Federal Open Market Committee (Fomc) had “devoted considerable time to issues relating to an exit strategy”. He added that they were all confident that the Fed had “the necessary tools to withdraw policy accommodation, when that becomes appropriate, in a smooth and timely manner.” (Bernanke 2009).

Two years later exit strategy principles were formally discussed by members of the Fomc in their meeting of June 21-22, 2011. At the occasion, all but one of the participants agreed that before they initiated the normalization process they would first cease reinvesting some or all payments of principal on the securities held by them. They would then start raising their target for the federal funds rate. From that

point on, changing the level or range of that rate would become the primary means of adjusting the stance of monetary policy. During the normalization process, adjustments to the interest rate on excess reserves (IOER) and to the level of reserves would be used to bring the funds rate toward its target. Sales of securities would commence sometime after the first increase in the target for the funds rate.

Within the Fomc, discussions around the theme were resumed in 2013. On the April 30-May 1 meeting, participants began a review of the principles outlined two years earlier. They appeared to Committee members as “generally still valid”, but changes in circumstances required a few modifications. At the end of the meeting, “the Chairman directed the staff to undertake additional preparatory work on this issue for Committee consideration in the future”.

New discussions took place over the course of several meetings during 2014. In the September 16-17 meeting, Committee members agreed on some changes to the original principles. Once again, all but one member supported the announcement of a set of modified principles, which they intend to implement when it becomes appropriate to begin normalizing the stance of monetary policy.

The idea now is that when the economic conditions and outlook warrant a less accommodative policy, the first step will be to raise the target range for the federal funds rate rather than to cease reinvesting payments of principal on the securities held by the Fed. During normalization, moving the funds rate into the target range will primarily involve adjusting the interest rate the Fed pays on excess reserve balances. As explained below, to help control the federal funds rate, the Fed will count on an overnight reverse repurchase agreement facility, to be phased out when no longer needed for that purpose. Reinvestment policy will now change only after the Fed begins raising the funds rate, there being no plan for selling agency mortgage-backed securities as part of the normalization process.

The modified principles had already been announced by William Dudley, president of the Federal Reserve Bank of New York, in a speech made on May 20, 2014. The idea that outright agency MBS sales were no longer contemplated, for example, was already there. The same is true in regard to the decision to delay the end of reinvestments. Dudley explained that ending reinvestments prior to lift-off would

complicate the communication with the public. The new sequence of events would put the emphasis where it needed to be, that is, getting off the zero lower bound for the interest rates.

At the occasion, Dudley emphasized that, on the issue of how to control money market rates in the presence of an enlarged balance sheet, the Fed already had the necessary tool: the ability to pay interest on excess reserves.

As observed earlier, the liquidity facilities created by the Fed in response to the crisis had already caused a considerable enlargement in the volume of reserves in the banking system. At the end of September 2008, for example, total reserves had gone up from a historical average of US\$ 45 billion (up to August 2008) to over US\$ 100 billion, this new figure corresponding to approximately US\$ 60 billion in excess reserves. At that time, the fed funds target rate was 2.0%. With the tendency for bank reserves to continue growing, the usual open market operations - conducted with the purpose of guaranteeing that the federal funds market operates at a rate as close as possible to the target rate - were about to become less and less effective. In fact, in the presence of a zero opportunity cost (nothing being paid to banks for leaving idle deposits at the central bank), the growing availability of reserves led banks to push down the rate of interest at which they were willing to lend money to each other. The circumstances led the Fed to request Congress to advance the effectiveness of the authorization to pay interest on reserves – authorization had been granted in 2006, but effective only in 2011. The same legal instrument which approved of TARP, the Emergency Economic Stabilization Act, defined the new effective date to be October 1, 2008.

After stressing that the basic tool necessary to the control of money market rates was already available – that is, the ability to pay interest in bank reserves -, Dudley went on to further elaborate on the explanation he had given eight months earlier regarding how a new tool could strengthen the degree of control. (Dudley 2013).

The new instrument consists of a fixed-rate, full allotment, overnight reverse repurchase agreement facility that will be available to a broad range of counterparties, including nonbank primary dealers, GSEs and money market funds. Through such a facility, which is being routinely tested since the last quarter of 2013, the Fed defines

a fixed interest rate and accepts cash from eligible counterparties on an overnight basis. “Full allotment” means absence of any cap on the amount of funds accepted from any participant at the posted interest rate and the repo is of the “reverse” type because participants lend funds to the Fed, and not the opposite. A security is used as collateral.

Given the really large set of potential participants and the “full allotment” provision mentioned above, it seems fair to assume that the rate defined by the Fed for its overnight reverse repo operations will have a dominant influence in other money market rates, working in practice as a floor for those rates. According to the policy normalization principles and plans (announced after the discussions held at the September 2014 Fomc meeting), the idea is that the width of the target range will remain 25 basis points. In addition, the IOER will correspond to the top of the target range and the “offering rate associated with an ON RRP facility [will be] equal to the bottom of the target range for the federal funds rate”.

Bank reserves can certainly be drained through other mechanisms. One of them would be to conduct reverse repos for periods longer than overnight. Another one would be for the Fed to offer interest-bearing time deposits to banks, in which case funds would move out of reserve balances for the life of the term deposits. Apparently such alternatives are not being considered at the moment.

As to reducing the Fed’s securities holdings, it is worth recalling that as part of the exit strategy the Fed intends to move in that direction at some point after it begins to increase the target range for the federal funds rate. Since selling securities seems not to be part of the plan, reducing the Fed’s holdings will probably involve just ceasing to reinvest repayments of principal.

Policy Implementation

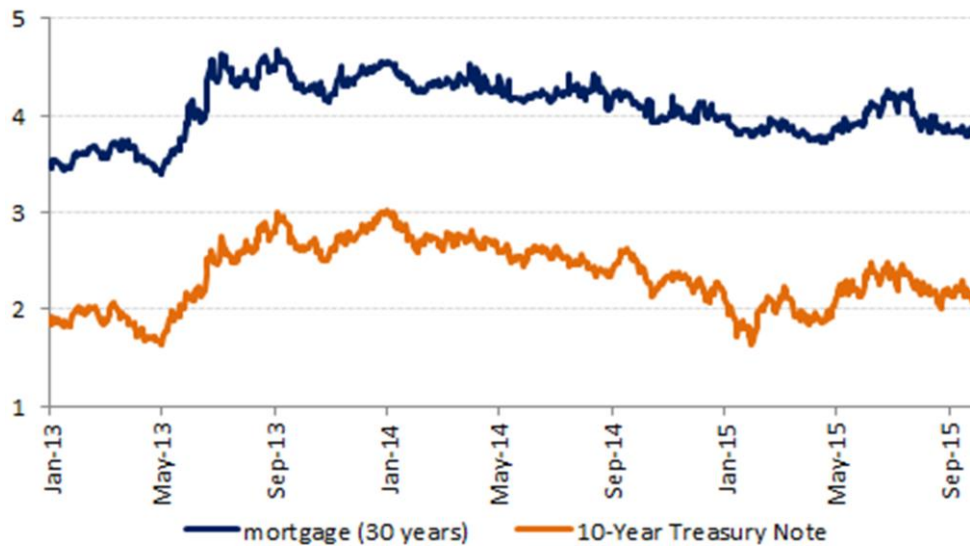
As of now, it has been more than nine years since the Fed last raised the policy rate. How will the market react when the first movement in that direction takes place? Will we have something similar to what happened in May 2013, when the Fed first spoke of the possibility of gradually ending the asset purchase program?

The episode became known as the “taper tantrum”. At the occasion, the Fed was in the last phase of that program, acquiring agency mortgage-backed securities and longer-term Treasury securities at a pace of US\$ 40 billion and US\$ 45 billion, respectively, per month. On May 22, in a testimony to Congress, the chairman of the Fed raised the possibility of the monetary authority tapering the purchase of those assets. The Fomc meeting held on June 18-19 was followed by a press conference by the chairman. In his initial remarks, Ben Bernanke said that “if the incoming data are broadly consistent with [the forecasts], the Committee currently anticipates that it would be appropriate to moderate the monthly pace of purchases later this year. And if the subsequent data remain broadly aligned with our current expectations for the economy, we would continue to reduce the pace of purchases in measured steps through the first half of next year, ending purchases around midyear”.

Markets stressed considerably after the announcements made by the Fed. From mid-May until September, 10-year Treasury notes went up from less than 2.0% to 3.0%, while 30-year mortgage rates went up from 3.7% to 4.7%, severely harming the recovery of the housing sector. It is interesting to notice that when the tapering process was formally announced – the decision was taken at the December 17-18, 2013, Fomc meeting, effective in the following January - the reactions were muted. Graph 3 shows the behavior of those rates since early 2013.

One likely reason why market reactions to the taper talk differed from the ones observed after tapering was effectively announced has to do with the fact that, when Bernanke first mentioned the possibility of reducing the pace of asset purchases, market participants had not been sufficiently prepared for that. Notice that on March 20, that is, two months prior to Bernanke’s testimony (May 22), the members of the Fomc had decided that the purchase program would continue until “the outlook for the labor market has improved substantially, in a context of price stability”. On May 1, the press release of the Fomc meeting which ended at that date stated that the Committee was “prepared to increase or reduce the pace of its purchases to maintain appropriate policy accommodation as the outlook for the labor market or inflation changes”. (Italics added). In other words, policy could go either way.

Graph 3: The Mortgage (30 Years) and 10-Year Treasury Notes (%)



Note: daily data. Source: Bloomberg.

Differently from what happened at that occasion, monetary policy normalization has been openly discussed for quite some time. Surely the criteria for adjustments to the policy rate (or target range) have been made very clear. In fact, members of the Fomc do not miss an opportunity to stress that their objectives are “maximum employment and 2 percent inflation”. They have also repeatedly said that, before removing the policy rate from its very low level, they want to see “further improvement in the labor market and [be] reasonably confident that inflation will move back to its 2 percent objective over the medium term”.

The Fed’s decision not to initiate policy normalization in September 2015 implies that the necessary criteria for the lift-off are yet to be met. And the decision was probably correct. The unemployment rate has declined considerably from the peak level of 10.0% observed in October 2009 to 5.1% in August 2015, but there is some consensus that there is need to look at other indicators to ascertain whether or not the slack in labor market has indeed disappeared. In any case, the fact is that the rate of growth of nominal wages has stabilized at about 2.0% per annum, hardly a sign of pressure in that market.

On the inflation side, the headline index indicates prices growing at 0.3%, while the core index shows 1.2%. Similar numbers for consumer price inflation are observed in other industrial countries— in the Eurozone, for example, the latest figures are 0.1% and 0.9%, respectively. In Asia, the three largest economies experience very low inflation as well. Consumer indexes show inflation rates of 1.6% in China, 0.7% in Korea and 0.2% in Japan. The phenomenon apparently has a worldly dimension.

A closer look at price behavior in the United States shows that inflation became negative at the producer level and that import prices fell 11.4% in the last 12 months. Perhaps more importantly, inflationary expectations declined considerably since last July, as measured by market interest rates. The average implicit rate for the next five years fell to 1.2% in mid-September, while for the five-year period five years from now dropped below 2.0%. Figures like these make it hard to accept the idea that the low-inflation phenomenon is temporary.

In reality, the fact is that we still lack a convincing explanation for the new inflationary environment we are living through. While it is true that aggregate demand has been evolving at a slow pace, it is quite possible that, particularly in the most advanced economies, supply-side factors may be giving a significant contribution to that environment. The channels would be the augmented transparency on the price and quality of goods and services and the increased competition caused by new products and services generated by the digital revolution, some of them supplied at zero marginal cost.

The above considerations mean that it would really be wise to postpone the initiation of the policy normalization process until the American economy strengthens further. The discomfort of members of the Fomc with the present situation is certainly understandable. A policy rate very close to zero is a sign of a serious anomaly. And several members of the Committee are clearly worried about the potential inflationary impact of the ultra-loose policy, the formation of asset bubbles and allocative problems generated by the close-to-zero rate.

Concerns with those issues are probably the reasons why Fomc members insist in signaling that the policy rate may rise soon. The estimates revealed after this last Fomc meeting indicate that 13 out of 17 voters still think that the lift-off will occur

this year. Interestingly, at the same time that they indicate this possibility, they continue signaling that when normalization begins changes in the policy rate will be made gradually, at irregular time intervals. Thus, while they are uneasy with the rate at zero, they fear that the appropriate timing for the lift-off has yet to arrive. The result is an inadequate approach. If policy is implemented this way, it would appear that they would be moving but at the same time apologizing for the initiative. Policy measures with such a characteristic look like decisions taken without conviction. And it is exactly this that could cause adverse market reactions similar to the ones observed in the taper tantrum episode.

The issue here is not “gradualism” itself, but the apparent difficulties revealed by Fomc members in signaling what to do after lift-off. Such an approach is in conflict with tradition. Monetary policy results do not come from changes in the policy rate per se but from the expected path of the policy rate. If the Fed does not feel comfortable in signaling such a path, the best thing to do is to stand still. Additionally, notice that the initial steps toward the removal of monetary accommodation usually do not cause disruptions like the ones associated with the taper tantrum. If they did, we would not have seen the numerous tightening cycles experienced in the past.

With regard to the exit principles, they have certainly been well conceived. It is worth noticing, however, that those who took part in their formulation did not imagine that recovery would be so slow and inflation so low. They probably did not predict the global nature of the problem as well. Present-day economic environment was not anticipated. Probably for this reason, Fomc members agreed to the idea of ceasing or commencing “phasing out reinvestments after it begins increasing the target range for the federal funds rate”. This suggests an intention to reinforce the impact on the economy of the changes in the policy rate. In this case, the degree of monetary policy accommodation would gradually change through actions on both the policy rate and the volume of bank reserves.

Ceasing reinvestments means redeeming maturing bonds. Redemption of MBSs does not pose any particular problem - its impact on reserve balance is straightforward. But the same is not true as regards redemption of government bonds. In fact, the payment of maturing bonds held in the Fed’s security portfolio will involve debiting the

balance maintained by the Treasury at the monetary authorities, a liability of the authorities but not bank reserve. Since the mentioned balance is generally low, besides being maintained for other purposes, redemption of Government securities will force the Treasury to raise money in the market, just like it normally does in order to cover ordinary budget deficits. As the Treasury does that, reserves will be drained and it will put pressure on market interest rates in a way that will not differ from what would occur in case the Fed decided to sell part of its portfolio, a measure which is not part of the strategy. (Koo 2015, pp. 92-94). Since this would be an extra force in the direction of removing policy accommodation, it is likely that this additional instrument will not be used if the Fed sticks to the planned approach. We see no reason to resort to two instruments if you are not totally convinced that the appropriate timing for starting to remove policy accommodation has arrived.

As argued above, the exit strategy was conceived to deal with a normal recovery. And we are far from observing that. Very likely, one day economic recovery will regain full steam. At that point, market participants will clearly understand that that is the case and will adjust interest rate expectations accordingly. Under such scenario, Fed's actions will become predictable and largely justifiable, there being no reason for concerns or potential regrets.

In sum, it does seem recommendable that lift-off is postponed until the economic recovery acquires faster speed and there are more concrete signs that employment and inflation are going back to target.

The risk involved in following this path is the Fed falling "behind the curve". In this case, the concern with financial instability and rising inflation would increase. However, the first of these problems could be dealt with through adequate macro-prudential measures. And, as for the second, one cannot argue that risking something like a 3.0% inflation rate is really a big problem, under the present circumstances – in the opinion of many, it would be a blessing.

Easier said than done, some might argue. But running the risks of being behind the curve seems much wiser than risking hurting the recovery by means of a premature interest rate movement.

J.J.S.

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■ Conversation with William White

This conversation was held through an exchange of e-mails between J. J. Senna and Dr. William White in the first days of September 2015. Dr. White joined the Bank for International Settlements (BIS) in June 1994 and was economic adviser and head of the Monetary and Economic Department of that institution from May 1995 to June 2008. Prior to joining the BIS he spent 22 years with the Bank of Canada. He became Deputy Governor of the Bank in September 1988, a position he held until 1994. Since 2009 Dr. White is the chairman of the Economic Development and Review Committee at the Organization for Economic Cooperation and Development (OECD) in Paris.

Price Stability

■ **On the issue of price stability it seems that central bankers took the lead and academic economists the backseat. Monetary authorities started having low and stable inflation as their main objective around the mid-1970s. The Germans and the Swiss were the pioneers. A few more years and authorities in the US and other European countries were pursuing similar policies. In the meantime, mainstream academic economists were still discussing the costs of inflation, arguing that they were not as high as imagined. Many believed that whatever the costs they could be largely mitigated by means of indexation.**

Academic opinion on this issue started changing only in the second half of the 1990s, when low inflation had already become a well-established goal and inflation targeting had been introduced. Canada was the second country to adopt the new regime, in 1991. And you were there, taking part in that historical process, as Deputy Governor of the Bank of Canada. Could you tell us how that process evolved in your native country, indicating the main factors behind the option for low and stable inflation?

Opting for low inflation in Canada was the result of both theoretical insights and practical experience. As for theory, people had believed in the 1960's that unemployment could be reduced at the cost of only a little more inflation. Milton

Friedman and Ed Phelps rather suggested that reducing unemployment below its “natural rate” would cause inflation to accelerate without limit. As for practical experience, the sharp acceleration of inflation in the advanced market economies (AME’s) in the 1970’s seemed to confirm that this theory was right.

Of course, the Bank of Canada might have opted to try only to stabilize the level of inflation, albeit at a historically high level, but we decided that this was not a desirable option. First, the “stability” of a high level of inflation is inherently fragile. If the central bank is willing to live with 10 percent inflation, why not 12 percent or 15 percent or whatever? A low level is inherently more stable, and the experience of stability anchors and reinforces expectations of stability in a virtuous circle. Second, the costs to the real economy – largely in the form of inflation induced misallocations of resources – were becoming increasingly clear by the end of the 1970’s. We eventually homed in on a target of around two percent for CPI inflation. While there was no science behind this decision, it allowed for some upward bias in the measured CPI and also allowed some room for relative wage adjustments.

As for the adoption of a more formal inflation targeting regime in 1991, both the Bank of Canada and the government felt that more transparency about the objective of monetary policy would also help to anchor inflationary expectations. Moreover, assuming the economy was subject only to demand shocks, there would be no conflict between maintaining inflation at the target level and maintaining full employment. Of course, in retrospect, I wish we had foreseen more clearly the possibility of supply shocks as well as some of the other undesirable side effects of inflation targeting regimes.

Technology and Monetary Policy

■ **In the developed world, the macroeconomic scenario observed today is a lot different from the one experienced in the 70s and 80s. Central bankers are concerned with inflation being too low, rather than too high. Domestic absorption has been growing at very slow speed in several areas, there being those who think that the weakness in aggregate demand has a chronic nature.**

At the same time, the so-called Industrial Revolution III (computers, the Internet) is well under way. Those who hold an optimistic view as regards its effects on the economy, like Brynjolfsson and McAfee, authors of *The Second Machine Age*, claim that the impact of IRIII on productivity gains will be at least as relevant as that produced by IRII (electricity, internal combustion engine). All we need is time for supplementary investments to materialize.

Productivity trends have not changed recently. Nevertheless, innovation has allowed a large number of new services and products to spring up, many of them supplied at zero marginal cost. Information on prices and the quality of goods and services flow at an amazing speed. Competition is tougher every day in many segments of the economy. My questions are: do you think “supply-side factors” such as these can be part of the explanation for the low-inflation phenomenon? Do you think they pose an additional challenge to central bankers?

Let me distinguish between three periods; the lead up to the crisis in 2007, the period since the crisis began, and what the future might or might not hold for us. In all three, one can assert that supply side changes do pose challenges to central bankers.

In the decades leading up to the crisis, inflation in the AME’s was generally quite subdued. I have no doubt that supply side factors figured heavily in this. For a time, productivity increases in the AME’s themselves constituted an important factor driving down costs. Even more important was the return to the global production chain of what were previously “command and control” economies, especially that of China. This had a direct effect, pushing down the prices of traded goods and services. However, it also had the indirect impact of restraining wages and loosening up labor practices since producers in AME’s could issue credible threats to move to emerging markets (EMEs) if worker’s demands were deemed excessive.

This should have been seen as a “good” or at least “benign” deflation, like many previous periods in history. Unfortunately, most central banks in the AME’s thought of it as a “bad” deflation, of the sort that uniquely characterized the 1930’s, and took vigorous steps to resist it. Monetary policy thus eased sharply in cyclical downturns

and tightened much less sharply in upturns, with this asymmetry leading to policy rates ratcheting down in successive cycles and eventually hitting the Zero Lower Bound. In this environment, credit growth in the AME's accelerated and the quality of credits decreased markedly. By 2008, the total amount of AME private debt had risen to unprecedented levels and the prices of many financial assets were at record highs. In short, "imbalances" were becoming increasingly evident that would in the end be a threat to financial stability.

Closely related, the currencies of the AME's, not least the US dollar, weakened and capital inflows pushed up the value of many EME currencies. Given their fear of floating, most EME's resisted this tendency through exchange rate intervention and easier monetary policies. Unfortunately, the result of this was effectively to import into EMEs the problem of "imbalances" that were already full blown in the AME's. In effect, by 2008, the global economy was simply an accident waiting to happen. The failure of Lehman Brothers was the trigger for the crisis but it could have been anything.

Since the crisis began, supply side factors have also played a role though in a rather more complicated way. On the one hand, most AME central banks would agree that the level of domestic potential output has fallen due to the crisis. In many countries, workers have lost jobs that will never return and they might be permanently unemployable. Further, much fixed capital has been made redundant and investment levels have remained unusually low in spite of even more aggressive monetary easing in the AME's. By itself, this might have been expected to raise the risks of an inflationary outcome. On the other hand, it is simply a fact that most AME's seem to be facing deflationary pressures not inflationary ones. The explanation is likely to be that global factors affecting prices are increasingly dominating domestic factors. Over recent years there has been a massive increase in the global supply of commodities and also of manufactured goods. In part, this was due to even stronger capital inflows into EME's in the post crisis period, as the "currency wars" accelerated. Now that the EME's are facing the bust phase of the credit cycle, and as their currencies depreciate, the AME's seem likely to face even stronger deflationary pressures.

As for the influence of supply side factors even further ahead in time, prediction becomes ever more difficult. Robert Gordon predicts an ongoing slowdown in the growth of potential, while Brynjolfsson and McAfee say just the opposite. In the latter case of course, there will be the issue of where the aggregate demand will come from to benefit from the increased supply. Again, another challenge for central bankers?

Monetary Policy and the Equilibrium Real Rate of Interest

■ **Larry Summers has recently argued that industrial countries have experienced major structural transformations involving aggregate savings and investments. Such transformations would have pushed down the equilibrium real rate of interest, globally determined due to financial integration.**

To the extent that this is true, monetary authorities in the US and the euro zone, for example, had no choice but to lower their policy rates substantially – on average, real policy rates in those two regions were close to zero between 2002 and 2007. According to the argument, refusal to lower the policy rates would have hurt economic growth in a significant way.

Do you think this is an acceptable interpretation for the loose monetary policies practiced before the Great Financial Crisis? Assuming that equilibrium real rate has indeed fallen, and remains low or even negative, do present-day central banks really face a hard-to-deal-with trade-off between macroeconomic and financial stability?

Again we have to distinguish between the pre and post crisis periods. In the pre crisis period, I think there is an element of truth in what Summers suggests, but only a small element. What needs to be explained is the configuration of very rapid global growth, low inflation and very low interest rates. My preferred explanation is that global supply was expanding, as I just described, while investment in the AME's was very weak. In response the central banks of the AME's kept monetary policy very easy, again as I have just described. From a Keynesian perspective, this response of the central bankers seemed wholly appropriate given their domestic circumstances.

Nevertheless, I would fault the policy in two ways. First, was the degree of stimulus given to the real economy. Far from just maintaining growth at reasonable levels, global growth in the years leading up to the crisis rose to levels unprecedented in the post war period. Indeed, this phenomenon should have led to the conclusion that the “natural rate” of interest had risen not fallen. If, as is common, we associate the natural rate of interest with the expected rate of growth of profits, that too had risen sharply. Second, the Keynesian model of the economy totally abstracts from all the dangerous “imbalances” that eventually culminated in the crisis. Central bankers should have been paying much more attention to the writings of Hayek, Minsky, Koo and the Bank for International Settlements, all of whom warned of the longer term dangers of the excessive creation of credit and debt.

In the post crisis period, the continuing decline in investment in the AMEs could well signal a decline in expected profits and the natural rate of interest. From a Keynesian perspective this seemed to justify ultra easy monetary policy to get the financial rate of interest closer to this lower natural rate. However, this again implied ignoring all of the “imbalances” such policies create, not least the threat they pose to financial stability. To put this another way, if excessive credit was the source of the problem that emerged in 2007, it is not self evident that still more credit since has provided an effective solution to the problem.

Rather, I would prefer to recognize that some debts will never be repaid. We should write them off, recapitalize lenders where necessary, and take the excess (unprofitable) production capacity out of operation. This would close the gap between the natural rate and the financial rate, now constrained at the Zero Lower Bound, by raising the natural rate. Of course, I recognize that such steps would prove to be very difficult politically. Nevertheless, they are necessary. Central banks can deal with illiquidity problems but insolvencies are matters for governments.

Ultra Easy Monetary Policy

■ In a widely read paper (“Ultra Easy Monetary Policy and the Law of Unintended Consequences”, Federal Reserve Bank of Dallas, Globalization and

Monetary Policy Institute, WP no. 126, September 2012) you argued that very low policy rates or policies affecting the size and composition of a central bank's balance sheet "have a wide variety of undesirable medium term effects – the unintended consequences". At the occasion, you also said that "exiting from a period of ultra easy monetary policy will not be easy".

Now, three years after the paper appeared, the Fed is very close to start the normalization process. With the benefit of having much more information on the conditions under which that process will initiate, what particular difficulties do you foresee as the Fed proceeds in the expected direction? Judging from what we have seen so far, what particular aspects of the undesirable consequences of the ultra easy policy would you stress?

Let me start first with the undesirable consequences of ultra easy monetary policies in the AME's. Today I would emphasize most the effects on EME's. At the global level, non financial debt levels as a percentage of GDP have risen significantly since 2007, with almost half of it being credit extended to or within EMEs. Whereas EMEs in 2007 were potentially part of the solution to inadequate global growth, they are now part of the problem. Moreover, much of the cross border borrowing has been done by corporations who have borrowed offshore and in dollars. There is thus the potential for currency mismatch problems going forward.

A second side effect that has not received enough attention has been the interaction between easy money and corporate compensation packages. Andrew Smithers, who blogs for the Financial Times, notes that low interest rates invite corporate managers to borrow and then buy back their own stocks. This raises equity prices to which management bonuses are linked. Similarly, by cutting investment, they can temporarily raise cash flow for the same purpose. The longer term threat to profits associated with this practice should seem obvious. In effect, through this channel and others, ultra easy monetary policy reduces the rate of growth of potential, and the natural rate of interest, in a vicious downward spiral.

Finally, I have become more attuned to the problems posed for financial institutions. Low term and credit spreads reduce bank profits over time. Yet we need higher profits

that can be added to bank capital to make them more resilient to shocks. Further, insurance companies and pension funds are finding it ever harder to generate returns that are sufficient for them to meet their contractual obligations. The dangers associated with such companies “gambling for resurrection” should also be obvious. As for the prospective tightening by the Federal Reserve, one must assume optimistically that this will happen only given a relatively strong growth momentum in the United States. However, even assuming such an environment, prospective difficulties are not hard to identify. Will the Fed be able to keep close control over short term rates given the massive overhang of excess cash reserves in the system? Will long rates move a little or a lot given worries about liquidity in many markets, due in part to collateral shortages generated as an unintended consequence of recent regulatory changes? Will the dollar strengthen even more, perhaps to the point where it threatens the US recovery? Could sales of US Treasuries by foreign central banks, trying to resist excessive weakening of their currencies, push up US long rates and pose another threat to US growth? There are no easy answers to these questions. Central bank actions over many years, indeed decades, have brought us to totally uncharted territory.

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