Modern challenges for the modern bank

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Abstract

The last fifteen years have been characterized by deep structural changes in the economy, some of which are rooted in the global financial crisis of 2008, that led to major economic shocks on both the demand and supply side. Central Banks (CBs) reacted to such shocks by cutting interest rates. Nevertheless, lowering short-term interest rates has led to the so-called zero lower bound. Thus, since 2009, CBs have turned to unconventional monetary policy tools, whose long-term effects are uncertain. This paper seeks to explore current challenges for CBs in advanced economies. The paper analyses the factors that challenged the way monetary policy was conventionally conducted and discusses both the pros and the cons of quantitative easing, forward guidance, negative interest rate policy and yield curve control. For this purpose, the analysis involves empirical evidence and historical examples, suggesting the need to harmonize monetary and fiscal policies.

1. Introduction[1]

The last fifteen years have been characterized by deep structural changes in the economy, some of which are rooted in the global financial crisis of 2008 (GFC), that led to major economic shocks on both the demand and supply side. Several countries have been dealing with persistent deflation, an increase in unemployment and secular stagnation (Bailey, 2021; Blanchard *et al.*, 2010a, Mishkin and Serletis, 2016). Furthermore, the challenges associated with climate change, mounting nationalism and protectionism and, more recently, widespread economy uncertainty have been exacerbated by the spread of Covid-19 (Ramsdem, 2020).

During the pre-GFC period, Central Banks (CBs) reacted to such shocks by cutting interest rates. Nevertheless, lowering short-term interest rates has progressively led to the so-called zero lower bound (ZLB), which makes it impossible to stimulate the economy should there be upward Gross Domestic Product (GDP) trends (Molyneux, 2019; The Economist, 2019a). Thus, since 2009, several CBs have turned to unconventional monetary policy tools (UMPTs), including quantitative easing (QE), forward guidance (FG), targeting inflation, yield curve control (YCC) and negative interest rate policy (NIRP), in order to reduce long-term rates, or to stop them rising (Nucera *et al.*, 2017; Tenreyro, 2021). CBs have shifted from targeting low and stable inflation to raising it (Bailey, 2021).

Despite the fact that UMPTs were implemented as temporary measures, they have become pervasive (Bonatti *et al.*, 2020; Nucera *et al.*, 2017; OECD, 2020). Also, sluggish recovery has fuelled scepticism regarding the effectiveness of UMPTs over time and economists have been raising questions regarding the future tasks and roles of CBs, and the need to align monetary and fiscal policies (Bailey, 2021; Blanchard *et al.*, 2010b; McAndrews, 2015).

In the light of today's new economic framework, this paper seeks to explore both current and future challenges for CBs in advanced economies, dealing with UMPTs. Indeed, the paper analyses the factors that challenged the way monetary policy was conventionally conducted. In particular, the paper aims to discuss the advantages and disadvantages of QE and UMPTs as alternatives to conventional monetary policy when short-term interest rates are at the ZLB. For this purpose, the analysis involves empirical evidence and historical examples of the use of QE and UMPTs, including FG, NIRP and YCC.

The remainder of this paper is structured as follows. Section 2 describes the ZLB and the factors that have increased the risk of hitting the ZLB. Section 3 illustrates the unconventional nature of QE

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[1] This manuscript was submitted in May 2021. Thus, it does not take into account both the recent dynamics of inflation rates and the monetary policies adopted by Central Banks to tackle inflation.

and its use. Section 4 discusses pros and cons of QE programs that have been recently implemented by advanced economies. Then, Section 5 describes UMPTs, including FG, NIRP and YCC. Section 5 also discusses advantages and disadvantages of UMPTs by providing empirical evidence. Conclusions end the paper.

2. The zero lower bound and factors of risk

CBs have usually lowered short-term interest rates to boost the economy. Nevertheless, the GFC has caused deep structural changes which have pushed CBs to decrease interest rates close to ZLB or, even below zero. However, ZLB is a constraint and interest rates are, usually, not expected to be set below zero. Thus, CBs have been challenged to find alternative tools, namely UMPTs, to stimulate the economy. There are several factors that have increased the risk of hitting the ZLB, including reductions in natural interest rate, secular decline in productivity growth, low inflation and lower expected inflation, the flattening of Philips Curve (PC), an ageing global population, which has raised the demand for savings, and the deregulation of the financial market and its crisis (Blanchard *et al.*, 2010a; OECD, 2020; Ramsdem, 2020).

To analyse these factors, we consider equations (1) and (2) of monetary policy (MP) with the liquidity trap (LT), which occurs when interest rates are very low and savings rates are high, rendering MP ineffective.

Given: MP = CB rule

$$\text{where} => \begin{cases} r_n = \text{the natural interest rate} \\ \\ \pi^T = \text{the inflation target} \end{cases}$$

$$\text{MP} => \begin{cases} r = r_n + \beta(Y-Y_n) + \gamma(\pi-\pi^T) \text{ for } i \geq 0 \quad (1) \\ r = -\pi^e \text{ when } i = 0 \quad \text{from the Fisher equation: } i = ri + \pi^e \quad (2) \end{cases}$$

A reduction in the natural interest rate reduces the interest rate, so for the same inflation (π) and expected inflation (π^e) decrease. The MP curve shifts right and moves into the LT. If we assume π^e is the same, the flat part of MP does not shift upwards, rather it becomes longer. The upward part of the aggregate demand (AD) does not shift because the flat part of MP has not shifted (**Figure 1**).

Figure 1. Reduction in natural interest rate.
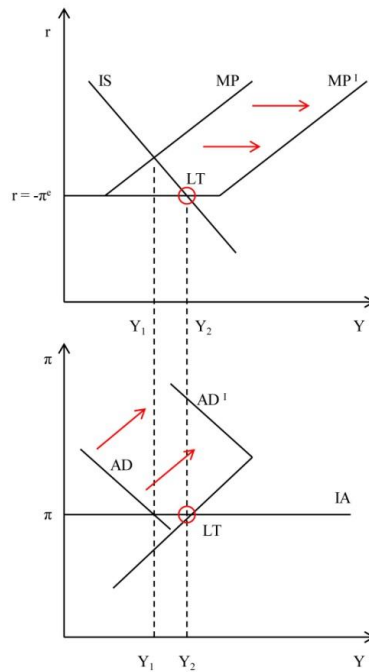
Source: Author's elaboration.

Then, if we assume expected inflation has not changed, a decline in productivity growth will reduce firms' demand for capital (Ramsdem, 2020). It also lowers the pressure on wages and on inflation. The upward part of MP shifts right into the LT, while AD does not shift but moves along (**Figure 2**).

Figure 2. Decline in productivity growth.
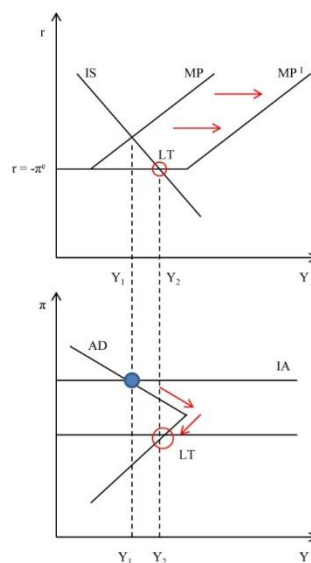
Source: Author's elaboration.

Furthermore, globalization, technological progress, weakening demand and large supply in advanced economies, have led to structural changes in the production and distribution of goods and services, thus contributing to lowering inflation and expected inflation, so increasing the risk of ZLB (OECD, 2020). Assuming both low inflation and lower expected inflation, MP shifts upwards right, moving into the LT. If there is a change in lower expected inflation, the kinked part of AD shifts upwards, moving into the LT (**Figure 3**).

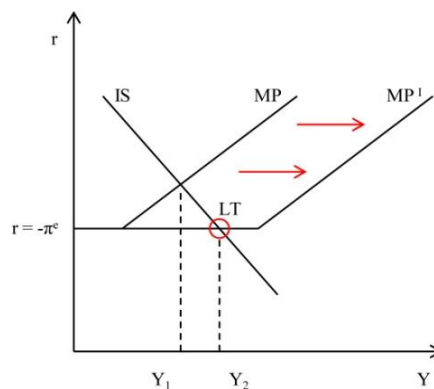**Figure 3.** Low inflation and lower expected inflation.
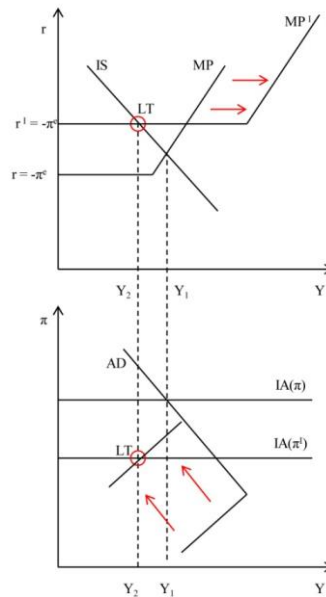
Source: Author's elaboration.

The risk of ZLB is also increased by a flatter Phillips Curve (PC) which will lower pressure on inflation when unemployment decreases. Assuming expected inflation has not changed, so the upward part of MP shifts right into the LT (**Figure 4**).

Figure 4. Philips Curve.

Source: Author's elaboration.

In the light of the above-illustrated factors, at the ZLB MP no longer functions, since an increase in the money supply does not lower the interest rate. Thus the economy moves into the LT. When output is less than its natural rate, inflation decreases and leads to a rise in the real interest rate. Consequently, output is further depressed, and the economy is destabilized, moving into a deflationary spiral (Romer, 2013).

3. The unconventional nature of quantitative easing and its use

Under normal circumstances CBs do not directly lend to either the private sector or the government. CBs boost the economy indirectly by lowering interest rates. In exceptional circumstances, at the ZLB, one possible response is QE, which is the large-scale purchase of financial assets by a CB. Such purchases can include government paper and corporate bonds, from financial institutions using money CBs have created out of nothing. QE lowers long-term interest rates and modifies the size and composition of both CB and commercial bank's balance sheets (Bailey *et al.*, 2020; McLeay *et al.*, 2014). The following **Figure 5** shows how QE works, the actors involved and the benefits for both businesses and consumers.

Figure 5. How quantitative easing works.
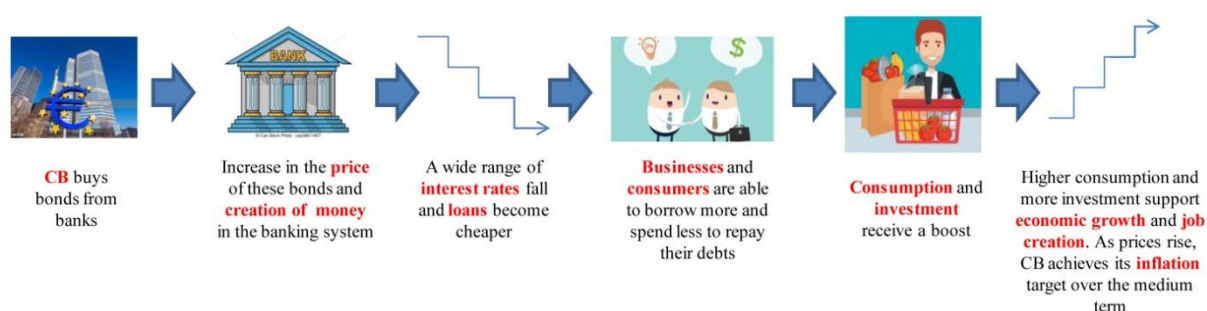
Source: Author's elaboration.

To analyse QE, we have considered the equations (3) and (4):

$$ri = ri(CB) + f \quad (3)$$

where
$$\begin{cases} ri = \text{the real interest rate for investment} \\ ri(CB) = \text{the short-term interest rate set by the CB} \\ f = \text{the additional term which refers to financial friction} \end{cases}$$

QE enters into Investment Saving (IS) equation:

$$Y = C(Y\text{-}T) + I\,(r+f) + G + NX\,(Y^*, Y, r^*) \quad (4)$$

When a CB purchases private security, its price rises while the interest rate falls, thus reducing the credit spread and do *f* and the real interest rate for investments. As a result, the AD curve shifts downwards right, increasing output. When QE shifts IS curve far enough to the right, the economy will move out of the LT (**Figure 6**).

Figure 6. Quantitative easing: moving out of the liquidity trap.
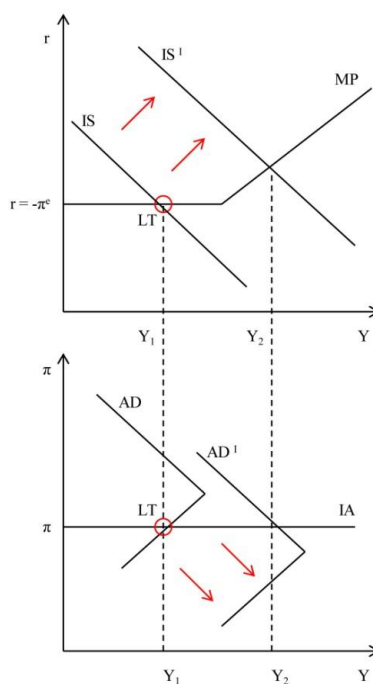
Source: Author's elaboration.

It has been highlighted that QE is unconventional because it is a form of credit allocation that is beyond the scope of any MP (Bank for International Settlements, 2019). However, CBs are not completely new to QE. Indeed, the Federal Reserve Bank (Fed) introduced similar policies during the Great Depression. Today, what makes QE unconventional is the unprecedented large scale and pace of purchases, and its multiple transmission channels (**Figure 7**) (Bailey *et al.*, 2020), which also put CBs into an "unconventional role vis-à-vis the private market" (Bank for International Settlements, 2019: 8).

Figure 7. Quantitative easing transmission mechanism.
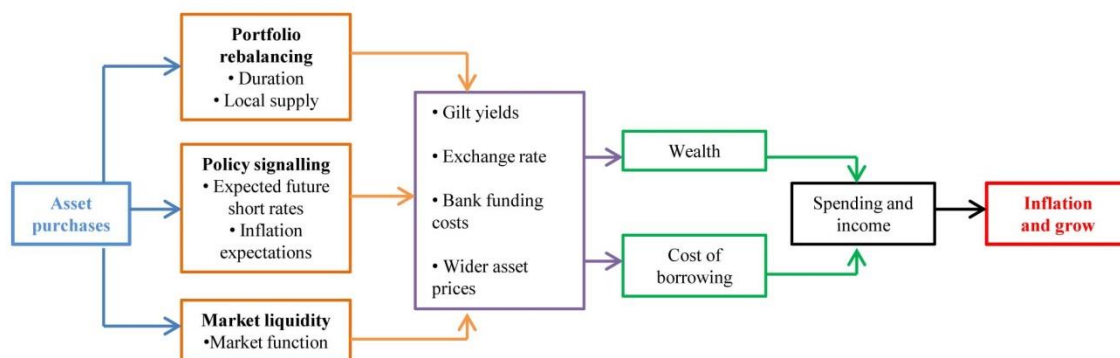
4. Pros and cons of quantitative easing

In the last thirteen years QE programs have been implemented in several advanced economies, including the USA, England, Japan and various European Member States. The following **Table 1** displays an overview of the main QE programs enacted by CBs of advanced economies, focusing on both the details of the programs and the main characteristics of the country's economy.

Table 1. Overview of QE programs implemented by CBs of advanced economies.

	Federal Reserve Bank (Fed)	Bank of England (BoE)	Bank of Japan (BoJ)	European Central Bank (ECB)
• *Launch date QE program*	Nov 2008	Mar 2009	Oct 2010	Mar 2015
• *Phase 1 program size*	$1.75 Trillion (28 months)	£200 Billion (10 months)	¥5 Trillion	€1.14 Trillion (18 months)
• *% of GDP*	12%	14%	0.76%	7%
• *Balance sheet size*	$2,106 Billion	£182 Billion	¥2,295 Trillion	€2,158 Billion
• *Program size / balance sheet*	83%	110%	0.2%	54%
• *Policy rate*	0% - 0.25%	0.5%	0.1% - 0.01%	0.05%
• *Inflation*	2.0%	2.24%	- 1.19%	0.0%

However, empirical evidence has revealed different degrees of effectiveness of QE programs, thus bringing to a wide range of pros and cons. On the one hand, QE stimulates the domestic economy and helps to address market dysfunction and liquidity demand shocks. Moreover, QE plays

a crucial role in offsetting disruption (Bailey *et al.*, 2020; Swanson, 2011; Tenreyro, 2021). In addition, QE fosters market expectations that interest rates would remain low (Ugai, 2007). More recently, it has been also highlighted that QE has worked effectively to face the Covid-19 crisis. Indeed, QE does seem to have effectively reduced tightening of financial conditions and to have lowered the risk of further stress on the economy (Bailey *et al.*, 2020).

On the other hand, QE has showed important drawbacks. Indeed, it has been stressed that it is particularly difficult to measure QE's effects (Hamilton, 2018).

A body of the literature has stated that QE has not a positive impact on growth in the long-term (Bonatti *et al.*, 2020; Nucera *et al.*, 2017). In particular, QE seems to be not sufficiently effective in boosting inflation and spending because interest rates will still be lowered by persistent factors: decreasing demographic trends, low productivity growth, and the perception of future pandemics (Tenreyro, 2021).

Furthermore, QE is becoming a pervasive tool (Bonatti *et al.*, 2020; Nucera *et al.*, 2017), raising concerns about both the large quantity and the high rate of asset purchases (Ramsdem, 2020). More recently, it has been stated that CBs independence could be harmed through purchasing government debt and by lowering the cost of borrowing for governments. Indeed, CBs could be blamed for manipulating exchange rates, such as in the case of the Federal Reserve Bank (Fed) (Bailey, 2021; Tenreyro, 2021; The Economist, 2019b).

It should be considered that QE has led to an unprecedented expansion in CB's balance sheet (Karras, 2013). Nevertheless, this has not always produced the expected increase in the money supply. This is true in the case of the USA. In 2008, the Fed started to implement extensive QE programs by quintupling its balance sheet. Initially these programs had positive results. However, the effects weakened, or became almost insignificant, over time (Hesse *et al.*, 2018). Indeed, money supply increased by less than 110% as it mainly flowed into excess reserves held by banks (Mishkin and Serletis, 2016).

Since the early 2000s, the Bank of Japan (BoJ) has also been implementing QE programs which have achieved divergent results, depending whether they were either short or long-term securities purchases (**Table 2**).

Table 2. BoJ's QE programs and their effectiveness.

	Launch date	Focus	Effectiveness
First Japanese QE program	• Early 2000s	• Only purchase of short-term securities.	• Failure. • Inflation turned negative. • QE did not affect credit spread, *f* and the real interest rate for investment did not decrease. • The money multiplier decreased significantly, weakening the impact of money injection. • Inflation expectations were not influenced by the temporary increase in the monetary base. • Banks did not transfer the injected liquidity into the non-financial sector.
Abeconomics program – Shinzo Abe	• 2007	• Purchase of long-term assets • Formal commitment of the government to achieve a 2% inflation target within two years.	• Reduction in *f*. • Lover interest rate for investment. • Stimulus to demand, output and inflation.

Source: Author's elaboration from Bini Smaghi (2009), Krugman (2013), Mishkin and Serletis (2016).

Then, despite the fact that the UK has recently announced the biggest asset-purchase in its history, the effectiveness of QE programs enacted by the Bank of England (BoE) in the last 11 years (**Figure 8**) is a controversial issue.

Figure 8. UK's QE timeline.
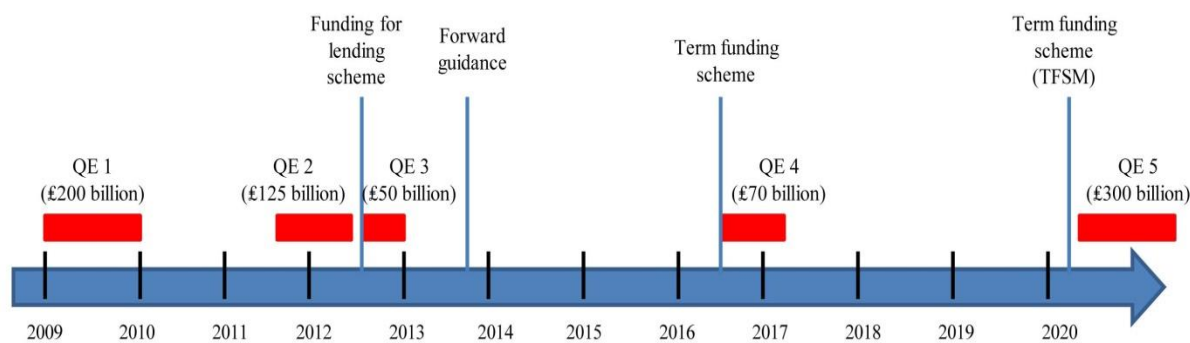
Source: Author's elaboration from Bailey *et al.* (2020).

On the one hand, QE did have a positive effect in the UK, however, subsequent actions produced almost insignificant effects (Hesse *et al.*, 2018). On the other hand, QE did minimize the spread of the costs of economic shocks and the potential for longer-term damage (Bailey, 2021; Ramsdem, 2020). Despite the fact that Bailey (2020), the BoE Governor, has stated that "going big and fast with QE" would work for the UK in the aftermath of pandemic, policy makers should be aware that the large quantity, and high pace, of purchases render QE's long term effects even more

uncertain.

Regarding the Euro zone, long-term purchases are also contributing to the economic recovery in the euro zone. However, inflation is far from coming close to the 2% medium-term target of the European Central Bank (ECB). Indeed, QE seems not sufficient for growth in the long term. To this end, Member States should engage in structural reforms so as to increase competitiveness and avoid protectionism. Moreover, policy makers should consider the risk of widening inequalities because QE increases the price of assets and thus favours security owners. Furthermore, QE can facilitate riskier behaviour as extra liquidity may be used to invest abroad (e.g. emerging markets), or on risky assets in the search for higher returns.

Overall, QE has been shown to be more effective for stimulating the economy in periods of economic crisis. In addition, the effectiveness of QE programs heavily depends on their timeliness. Thus, QE works more efficiently in a ZLB environment whenever the MP transmission process is impeded and conventional tools prove ineffective. Otherwise, under normal circumstances, rather than the ZLB, CBs should continue to use conventional tools to cut interest rates and boost the economy.

5. Unconventional monetary policy tools

Several countries have coordinated their QE programs with various unconventional monetary policy tools (UMPTs), namely forward guidance (FG), negative interest rate policy (NIRP) and yield curve control (YCC), to reduce long-term interest rates (Neely, 2015). The following **Table 3** displays an overview of the mandates, operational targets and UMPTs enacted by the CBs of advanced economies, including England, USA, Japan, Canada and the European Central Bank (ECB).

Table 3. Overview of unconventional tools implemented by CBs of advanced economies.

Central Bank	Mandate	Operational targets	Monetary policy tools
US Federal Reserve (Fed)	• Price stability. • Boosting employment. • Moderate long-term interest rates.	• 2% inflation target on average, measured by the PCE.	• **Conventional tools** • **QE** • **FG**
European Central Bank (ECB)	• Price stability.	• Inflation below but close to 2% over the medium term, measured by the HCP.	• **Conventional tools** • **QE** • **FG** • **NIRP**
Bank of England (BoE)	• Price stability.	• 2% inflation target at all times, measured by headline CPI.	• **Conventional tools** • **QE** • **FG**
Bank of Japan (BoJ)	• Price stability.	• 2% inflation target with overshooting commitment, at the "earliest possible time", measured CPI.	• **Conventional tools** • **QE** • **FG** • **NIRP**

			• **YCC**
Bank of Canada (BoC)	• Price stability	• 2% inflation target with a band (+/1%) over the medium term, measured by headline CPI.	• **Conventional tools** • **QE** • **FG**
Sveriges Riksbank	• Price stability	• 2% inflation target with a band (+ 1%), within 2 years, measured by the CPIF.	• **Conventional tools** • **QE** • **FG**

****QE** = quantitative easing; **FG**= forward guidance; **NIRP** = negative interest rate policy; **YCC** = yield curve control; PCE = personal consumption expenditure deflator; CPI = consumer price index; CPIF = consumer price index with a fixed interest rate; HICP = harmonised index of consumer prices.
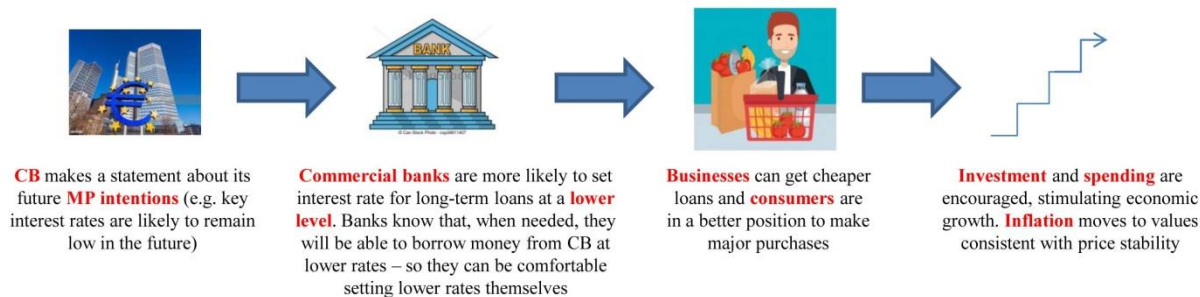
Source: Author's elaboration from OECD (2020).

From a general standpoint, FG is the CB's communication about its intended MP to influence policy expectations. FG aims at boosting investment and spending, stimulating economic growth, and so raising inflation to values consistent with price stability (Bank for International Settlements, 2019). In particular, we should consider two types of FG: FG without explicit commitment and FG with explicit commitment. The first consists in the communication of policy intentions by the CB. However, the CB does not include explicit commitments about targeted actions. This means that, in case of unforeseen events, CB and policymakers can abandon their intentions. On the other hand, this type of FG shows an important drawback. Indeed, in case of abandon, the credibility of both CB and policymakers could be seriously undermined.

With respect to the second type of FG, with explicit commitment, it can consist in either a calendar-based FG or an outcome-based FG. The first relies on the explicit conditional commitment to maintain an announced policy path for a certain period, while the latter is based on an explicit conditional commitment to maintain an announced policy path until a specific state of the economy is achieved. This means that commitments can largely influence expectations. On the other hand, flexibility is drastically diminished. In particular, whether circumstances would change in such way that it would be better to abandon commitment, CB may feel it cannot go back.

The following **Figure 9** shows how FG works, the actors involved and the benefits for both businesses and consumers.

Figure 9. How forward guidance works.

CB makes a statement about its future **MP intentions** (e.g. key interest rates are likely to remain low in the future)

Commercial banks are more likely to set interest rate for long-term loans at a **lower level**. Banks know that, when needed, they will be able to borrow money from CB at lower rates – so they can be comfortable setting lower rates themselves

Businesses can get cheaper loans and **consumers** are in a better position to make major purchases

Investment and **spending** are encouraged, stimulating economic growth. **Inflation** moves to values consistent with price stability

Source: Author's elaboration.

We should also analyse FG from a graphical point of view. Assuming same inflation and higher expected inflation, the real interest rate corresponding to a nominal rate of zero is lower than before. The flat part of MP moves downwards. Hence, the economy goes downwards along the IS curve. Output increases while the kinked part of AD moves down. Thus, an increase in expected inflation pushes the economy out of the LT. Higher expected inflation implies that firms and households believe that the currency for repaying loans will lose value. In this way a decrease in the real interest rate fosters demand (**Figure 10**).

Figure 10. Forward guidance: moving out of the liquidity trap.
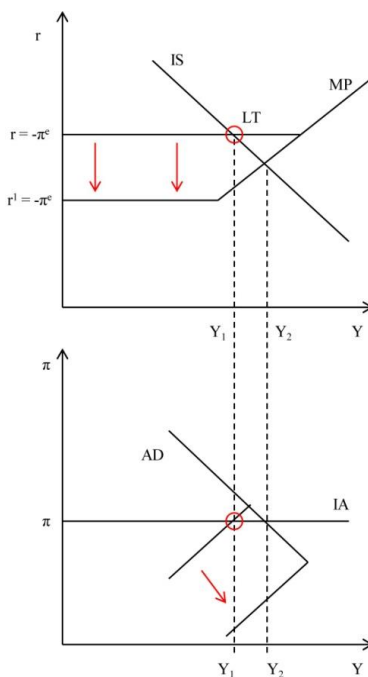
Source: Author's elaboration.

On the one hand, FG has been generally effective in decreasing yields. However, FG has generated different outcomes depending on both FG communication and the structure of each country's economy. Swanson (2018) showed that the effects of the US FG were significant and

analogous to those of changes in the policy rate. On the other hand, FG had limited impact in Sweden after 2009, as information was already included in its CB public reports (Woodford, 2013).

Among UMPTs, FG is the most difficult to apply because its effectiveness depends on credibility and capacity of communicating of CBs, as well as public's belief that inflation will rise. However, overreliance on FG may disincentivize private actors to shape their own forecasts independently, determining herd behaviour.

In 2012, UMPTs took a step further when several European countries and Japan implemented negative interest rate policy (NIRP) (Molyneux *et al.*, 2019). NIRP avoids triggering a deflationary spiral by encouraging private investment, increasing consumer spending, supporting price stability, and reducing exchange rate appreciation, thus returning to target inflation (Coeuré, 2014; Nucera *et al.*, 2017).

From the graphical point of view, NIRP removes the constraint i = 0, thus the flat part of MP disappears and there is no kink. Furthermore, the MP below ZLB is restored, so the normal MP is resuscitated (**Figure 11**).

Figure 11. NIRP: moving out of the liquidity trap.
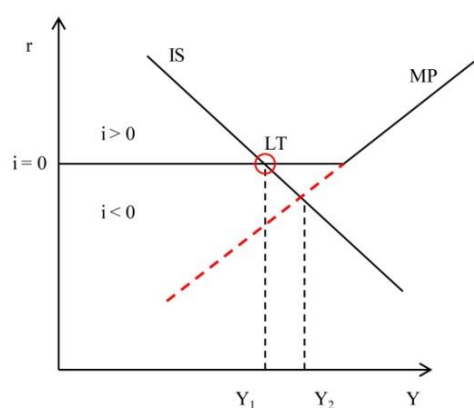
Source: Author's elaboration.

On the one hand, researchers have highlighted that NIRP may well have a positive impact on financial institutions and consumers. Indeed, financial institutions would benefit via an increase in loan demand, improved asset quality, and reduced risks of loans (Molyneux *et al.*, 2019; Nucera *et al.*, 2017; Schwaab, 2017). With respect to households and companies, they would face lower rates. This would result in a stimulus to both consumption and investing spending. Furthermore, NIRP would cause an increase in income and inflation (Eisenschmidt and Smets, 2019; Horvath *et al.*, 2018; Tenreyro, 2021). In addition, according to Tenreyro (2021) NIRP would foster a reduction of yields on corporate bonds, favouring a depreciation of the exchange rate as well as promoting equity prices.

On the other hand, a growing body of the literature has raised concerns about knock-on effects

of NIRP in the long-term. Indeed, NIRP would increase financial instability (Palley, 2019), while negatively impacting on both the whole economy and the financial intermediaries' performances (McAndrews, 2015). In particular, NIRP reduces bank profits and enhances financial disintermediation. This means that private agents could be stimulated in taking higher risks to seek for higher returns, favouring asset bubbles (e.g. housing market) (Inman, 2021; Molyneux *et al.*, 2019; Riley, 2021).

Furthermore, policymakers should not overlook the potential negative effects of NIRP on consumers. Indeed, households and businesses could suffer from a loss of income and, thus, would be incentivized to hoard cash rather than to invest or spend. In addition, pension and insurance funds would find harder to meet their long-term liabilities (Inman, 2021; Riley, 2021).

It should be considered that factors such as the structure of the economy can affect the effectiveness of NIRP among countries and over time. The effectiveness can also depend on NIRPs' alignment with other UMPTs, including QE and YCC. In particular, NIRP has been complemented by YCC, as in the case of Japan, to directly affect the market cost of borrowing for longer periods.

From a general point of view, the YCC works as it follows. The CB commits to buy whatever amount of bonds the market wants to supply as its target price. Once bond markets internalize the CB's commitment, the target price becomes the market price. Then, long-term market yields on benchmark securities are lowered. As a result, investors are encouraged to direct capital elsewhere, such as to investment by companies willing to expand in innovative or strategic sectors (Belz and Wessel, 2020; Kliesen and Bokun, 2020).

In 2016, the BoJ started targeting long-term rates and, also, committed to keeping the market yield on ten-year-government-bonds close to zero. On the one hand, the Japanese experience has shown that credible YCC policy can be more sustainable for CBs than a quantity-based asset purchase program (Kliesen and Bokun, 2020). Also, lowering rates is simpler to communicate than bond purchase programmes (Sandbu, 2021). In the case of Europe, we may consider that making the common bond yield an operational target would encourage markets to adopt it as a benchmark for pricing other securities. It would also boost the European Union's policy target of forming a banking union.

On the other hand, YCC has been criticised for falling under the European treaty ban on offering credit facilities to governments. Furthermore, it has been highlighted that YCC can threaten CB independence and the requirement that the market must believe that the CB will keep interest rates on a path consistent with its targets (Kliesen and Bokun, 2020).

6. Conclusions

MP has shifted from focusing only on the official interest rates to a multi-dimensional choice of UMPTs. What makes UMPTs unconventional is their combination of policy actions, their large scale of deployment and their purpose. Moreover, the deployment of UMPTs has put CBs face to face with the private market.

On the one hand, CBs are challenged to choose those UMPTs which appear best suited for each task. UMPTs are ensuring the flexibility required to address the Covid-19 crisis. In particular, the timeliness implementation of QE has shown to be effective in periods of crisis at the ZLB. On the other hand, UMPTs represent a natural and informative experiment since their long term effects are still little known. Therefore, CBs should be aware of the potential risks of permanent QE programs, including moral hazard and financial instability.

CBs and governments should consider that UMPTs are not mutually exclusive, and they do indeed seem more effective when coordinated with fiscal policies. At the European level, the shock of the pandemic, and the following policy responses, especially the Recovery Fund, offer an opportunity for CBs and governments to focus on the challenge of a monetary and fiscal union. The sustainability and effectiveness of MP will also depend on the harmonization of fiscal targets and constraints.

In conclusion, despite the fact that CBs have been criticised for being politicised when using UMPTs, CBs should engage with the public to strengthen their legitimacy and credibility. Indeed, the effectiveness of UMPTs also depends on the public's belief in the fact that they can be implemented. Older institutions and tools are no longer suitable for today's economy, thus CBs should begin to redesign their role, their tasks, their tools and their communication.

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