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The ECB: preliminary remarks on a hypothetical QE

- Quantitative easing impacts real interest rates through five distinct channels, defined as signalling, targeting, liquidity, credit and inflation
- They all push interest rates down except for the liquidity channel, which may raise the rates of liquid assets.
- The strength of each channel will depend on the asset under consideration: a hypothetical QE would have a large net impact on long-term periphery yields, but a small impact on core and shorter-term bonds
- The composition (and not only the size) of QE purchases would be an important determinant of the net effect on different yields: targeting only private bonds would lower the impact on sovereign yields, an option preferred by most authorities yet limited by the size of that market
- Under the assumption that QE would only target sovereign bonds (in accordance to their capital keys), the impact of a one-trillion-euro purchase would be sizable in periphery yields (a reduction of more than 200bps in Greece and more than 100bps in Spain), yet much smaller in core ones (a fall of around 60bps in Germany). We also estimate that such purchase would lead to an 8% depreciation of the euro vis-à-vis the dollar

1. The whys and hows of implementing QE

Recent statements by ECB officials have once again raised the prospect of QE implementation as a means to fight downside risks to price stability. Such stability would be achieved by boosting inflation expectations away from any deflationary threat and by reducing (real) long-term interest rates so as to kick-start a still-sluggish economy.

ECB authorities have given different views on what would trigger a QE announcement; yet according to Draghi:

> *… a worsening of the medium-term outlook for inflation (which) would warrant a more broad-based asset purchase programme. One cause for this could be by a broad-based weakening of aggregate demand that derails our baseline scenario of a moderate recovery. Another cause could be a substantial positive supply shock that, given the current low level of inflation, loosens the anchoring of medium-term inflation expectations.*

We consider that, at a minimum, the medium-term outlook for inflation would need to be revised downwards significantly by June (the month when new staff projections are to be released). Unanticipated falls in inflation or an on-going appreciation of the euro in the two coming months would set the ground for such a revision. According to our models, the probability of inflation rates below 0.5% in the coming two months is 15% (and 25% for rates below 0.7%).

How would it be implemented? To be effective, QE would need to be substantial, thus the purchase of private assets (the ECB´s preferred option) would soon hit a ceiling, over which the ECB would start risking the formation of local bubbles: "it is not easy to design a QE programme on private debt that is large in size and doesn´t have risk for financial stability". Moreover, SME ABS (the ECB´s preferred private asset, as it supports lending to the real economy) is a very small market of around EUR100bn (90% retained).

As a result, if needed, the ECB would have to purchase government bonds, a decision that raises the question of how much to buy from each member country (and at what maturity). Authorities have hinted at some answers to the question. Jens Weidmann recently stated that "it would have to take into account not only the ECB´s capital key but also the riskiness of bonds." Meanwhile, Benoît Cœuré said that purchases would focus on "relevant maturities, the intermediate to the longer part of the yield curve." Members of the governing council have made no mention of the total amount of potential purchases, yet the ECB has already worked with a simulation of EUR1trn.

2. Channels by which QE may alter real rates

Quantitative easing may affect yields through at least five distinctive channels[1], with most of those channels favouring a reduction, rather than a rise, in real interest rates. Moreover, the impact through most channels discriminates between assets, with some channels favouring bonds with longer maturities and others favouring assets that are either more liquid, riskier or scarcer. Through the understanding of these channels, we may start forecasting the net effect of QE on more than a sole generic interest rate and draw conclusions about each relevant rate within the eurozone: an important insight that will weigh heavily on the upcoming debates within the ECB´s governing council.

Signalling channel

QE has proved to be a credible anchor of future policy rates. Central banks do not start a tightening cycle while undergoing QEs, because it would magnify their financial losses and, even more importantly, would create confusion within markets demanding a clear stance from monetary authorities. As a result, committing to a "long-lasting" QE has been a very credible

1: The classification used is based on the one put forward by Krishnamurthy A. and Annette Vissing-Jorgensen (2011), "The Effects of Quantitative Easing on Interest Rates: Channels and Implications for Policy"

device for communicating forward guidance, prompting markets to cut their policy-rate forecasts, which have in turn dragged yields down along the whole curve.

The signalling channel may also impact yields by altering the term premium of medium-term yields. By credibly delaying the first rate hike, the ECB may reduce any *uncertainty* surrounding medium-term rate forecasts. As a result, duration risk and the term premium may fall (especially for those maturities close to the expected start of the tightening cycle).[2]

According to several economists, the implicit forward guidance has been a major force behind the success of recent QEs (by acting not only through this channel, as we will see below). If the ECB were to reach the same conclusion, long-term inflation forecasts would need to go down significantly for it to venture into QE (as of now, the ECB's forward guidance strategy remains extremely weak, proof of the institution´s unbroken reticence to use any pre-commitment device).

Targeting channel

In an imperfect market with "preferred habitat demand" and/or fragmentation, the growing scarcity of any particular type of bond would increase its value. Thus the term premium may also drop as a result of a QE bias towards the purchase of larger maturities. By the same token, this channel would have a larger impact on corporate yields if the ECB decides to target private rather than government assets.

Moreover, if purchases are biased towards "safe-haven" bonds, this channel would increase the spread of riskier assets. It is thus predictable that German authorities would stress the need to buy Bunds (in line with Weidmann´s quote cited in the first paragraph) so as to curb other channels' favourable impact on the spreads of riskier "periphery bonds" (in the eyes of these authorities, "too big a reduction in spreads" may unintentionally turn QE into an undeserved reward to governments that have yet to fulfil their promises of reform).

Liquidity channel

As central banks trade bonds for "extremely liquid" reserves, QE increases liquidity in the economy, thus reducing the (negative) premium paid for liquidity/safe-haven purposes. Consequently, yields of liquid assets (e.g. government bonds) experience an increase! In an extreme case, as was observed in Japan at the start of its revamped QE initiative of 2013, purchasing "too much" of any liquid asset may threaten to turn it completely illiquid, trumping all other channels and raising the yield of the asset being targeted.

Credit channel

The impact of QE on risk premia can be split in two. First, QE reduces default risk as economic prospects improve. The effects of forward guidance, for example, may be magnified through the bank-lending channel, boosting economic activity and thus lowering aggregate risks throughout the economy. Second, the *price* of aggregate risk also falls, as the rise in liquidity triggers a "search for yield" that can cross borders and have a global impact. Consequently, a QE by the ECB would reduce the price of CDSs across all assets, leading to a larger reduction in BBB/periphery yields relative to AAA/core ones.

Inflation channel

Real interest rates are the difference between nominal rates and inflation expectations; thus any effect of QE on inflation expectations will have a direct impact on real rates. Consequently, to the extent that QE is expansionary, it should help to both raise inflation expectations and

2: It is worth mentioning that some economists contend that this channel may raise rather than lessen the term premium along the whole curve. They allege that QE fosters inflationary risks, which in turn raise uncertainty about future policy rates and thus increase duration risk. Nonetheless, most economists state that in the current context uncertainty about inflation is actually reduced by QE: inflationary tail risks do not increase, but deflationary tail risks are hopefully stamped out.

reduce real rates. Yet QE's efficacy on this front remains a topic of heated debate. Close-to-zero interest rates, as in the current case, interrupt the transmission channels of money multipliers, obscuring QE´s final effect on inflation. Thus, if the ECB is focused *only* on rising inflation expectations, the governing council would probably not rush into using this particular instrument.

Recent QEs in the US, Japan and UK have shed some light on the relative importance of these channels, on-going debates notwithstanding. In the US, while QE1 announcements were the most successful in lowering rates (succeeding in reducing 10Y yields by close to 90bp), QE2 and QE3 announcements also impacted markets in the intended direction (in particular, QE3 reduced 30Y yields by more than 40bp). The success of QE1 is in large part attributed to the surprise of its announcements, while other QEs had been widely anticipated.

With regard to the credit channel, one can observe that previous QEs have had a large impact on riskier bonds, but mostly when announced at a time of market turmoil: the first announcement of QE1 in 2008 brought a large reduction in the CDSs of B-rated US companies (-708bp in 10Y maturities) while the impact was insignificant by its last announcement on March 2009 (that announcement reduced B-10Y CDSs by a meagre 18bp). The liquidity channel – the only channel to raise rates -- has proved to be significant not only in Japan: even in the successful case of QE1, the impact of the liquidity channel on 10Y Treasuries was +93bp.[3].

In most cases, the signalling channel has delayed the expected date of the first rate hike by around four to six months: if the ECB were to announce a QE in June, it would not affect 1Y bonds and raise 2Y bonds by less than 15bp, as the first rate hike is currently expected by March 2016 (i.e. one year and three months later than the hypothetical announcement). Finally, the targeting channel has been one of the dominant channels for recent QE announcements, explaining between 50% and 70% of the reduction in 10Y Treasury yields.

Table 1
Qualitative impact of QE channels from a "steady state

Assets / Channels	12 Month interest rate	2Y bond yield Core	2Y bond yield Periph.	10Y bond yield Core	10Y bond yield Periph.	Corp. BBB	Corp. AAA
Signaling	0	- -	- -	0	0	-	-
Targeting	0	0	0	- - - -	- - -	0	- - - -
Liquidity	+/0	+ +	0	+ +	0	0	+
Credit	0	0	-	0	- - -	- - - -	0
Inflation	0	-	-	0	0	-/0	-/0
RANKING 1: higher impact 6. Lower impact	6	5	3	4	1	2	3

Source: BBVA Research

3. Preliminary results on the impact of the programme

If the ECB were to implement QE, markets would react across segments and across countries, with the largest impact benefiting the periphery, albeit not by the same proportion.

In what follows, we include some preliminary estimates of the impact of a EUR1trn QE programme on both the yields of sovereign 10Y bonds and the USD/EUR exchange rate. We assume that ECB purchases would only include government bonds in accordance with the ECB's capital key. We further assume that, as in recent QE experiences, most of the impact on yields would be at around the time of the announcement.

3: Krishnamurthy and Vissing-Jorgensen (2011) The Effects of Quantitative Easing on Interest Rates: Channels and Implications for Policy.

- We use a panel data that includes several developed economies over a span of ten years. Table 1 shows the estimated impacts through the targeting and credit channels; we find that QE would reduce the rates by 60 to 200bps, depending on the country. Yet when including other channels (the liquidity channel in particular), we would see a smaller net effect on safe-haven bonds such as the Bund, the yield of which would then drop by only 60bps.[4] (see annex)
- To estimate how a QE programme would affect the EUR/USD rate, we use our rate differential model which includes two-year bond spreads, the net long positions of the euro in futures markets and the ratio of Fed/ECB assets. Such assumptions lead to an **8% depreciation of the euro vis-à-vis the USD.** This depreciation would be sustained by the Fed´s expected reduction of its balance sheet. (see annex).

Table 2
Estimated impact of hypothetical QE on 10Y rates: Targeting and credit channels

		Foreign official ownership of government debt					Impact on 10Y bond yields
		Latest data (3Q13)		QE (1trn.) (if the ECB only purchases government bonds)			
	Country	Amount (bn euros)	% total debt	Amount purchased by country (bn Euros) (According % ECB capital key)	Change in foreign official ownership of government debt (% total debt)	Total foreign offcial holdings of debt (% total debt)	Contribution to change in foreign official ownership in 10Y yields after the QE (bps)
1	Greece	36	46	29	37	82	-236
2	Portugal	31	27	25	22	50	-143
3	Spain	105	14	126	17	31	-108
4	Germany	603	39	257	17	56	-107
5	Netherlands	146	41	57	16	57	-104
6	Austria	45	23	28	14	37	-91
7	Ireland	20	17	17	14	31	-91
8	France	549	34	203	13	47	-81
9	Belgium	46	13	35	10	24	-66
10	Italy	137	8	176	10	18	-65

Source: BBVA Research

4: We assume the impact through the liquidity channel would be half the size of the one observed in QE1, as US and German liquidity premia respond with similar elasticities, yet current liquidity conditions are less dire than back in 2008.

Annex

Panel data approach to estimate the impact through the targeting and credit channels on Eurozone bonds.

We use the panel data in Arslanalp et al.,[5] which establishes a relationship between foreign-investor demand for sovereign debt and long-term sovereign bond yields, The analysis is done with quarterly data for all 22 advanced economies (Aes), composed by Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Korea, the Netherlands, New Zealand, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States. The data analysed covers practically a decade (from 1Q04 to 3Q13) and includes the standard macroeconomic determinants of long-term sovereign bond yields (short-term bond yields, GDP growth, CPI inflation, and the debt-to-GDP ratio).Moreover, the analysis controls for government debt and the purchases by each country´s central bank. It also includes a breakdown on foreign debt (by considering share of both official and private foreign debts) to estimate long-term sovereign bond yields. Estimations are performed using fixed effects.

Estimated impact on the EUR/USD rate

We estimate the impact on the EURUSD with a rate differential model (short term model).

The model includes: two-year bond spread (Germany versus US), net long positions of the euro in futures markets and the ratio of Fed over ECB assets.

[5] Serkan Arslanalp and Tigran Poghosyan: *Foreign Investor Flows and Sovereign Bond Yields in Advanced Economies*. 2014, WP/14/27

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