Quantitative easing (QE) in the Euro area: an exposition

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The ambitious QE program of the ECB, as decided upon in January 2015, deserves close monitoring. The article tries to shed light on the expected risk sharing under QE, explores different transmission channels, and reflects on the potential impact of the program that aims at raising inflation expectations. A brief look at similar monetary policies in the US and the UK tries to help in identifying common ground. The overall effects of QE remain, however, uncertain. The authors expect the biggest effect on economic growth and inflation via the depreciation of the euro exchange rate.

Introduction[1]

In January 2015, the European Central Bank (ECB) decided to launch an expanded asset purchase programme, extending its existing purchase programmes for asset-backed securities and covered bonds with purchases of government bonds and bonds of EU institutions.[2] The ECB followed other central banks (such as the Federal Reserve, the Bank of England and the Bank of Japan), which have used outright purchases as part of their monetary policy already for several years. This policy is often referred to as quantitative easing, or QE.

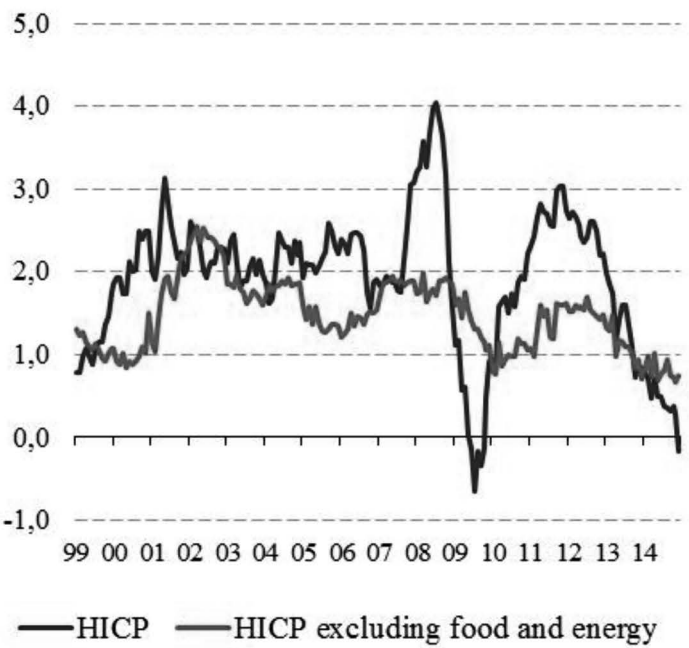
The ECB's Governing Council took this decision in order to address the risks that inflation expectations become unanchored. End 2014, most indicators of actual and expected inflation in the euro area had drifted towards fresh lows,

1 Views expressed are those of the authors and do not necessarily reflect official positions of De Nederlandsche Bank. We thank *Jan Marc Berk* and *Peter van Els* for their feedback on a previous version of this paper.

2 The programme will encompass the asset-backed securities purchase programme (ABSPP) and the covered bond purchase programme (CBPP3), both of which were launched in 2014. Under these programmes assets were to be bought at a rate of around €10 billion a month. The Jan. 2015 decision (see *J.J. Hesse*, Die Europäische Kommission — vor einer Zeitenwende?, in: ZSE 4/2014, 408-432) means that the Euro system will buy an additional €50 billion a month of bonds of national governments and European institutions.

although core inflation remained relatively stable (see Figure 1).[3] The Governing Council took the view that this situation required a forceful monetary policy response. According to the ECB, "the interest rate instrument alone has not been sufficient to steer inflation closer to 2 per cent. If the ECB still had room to cut interest rates, it would have done so already. Given that this option was no longer possible, the asset purchase programme was the only appropriate tool to enable the ECB to achieve a similar result. To fulfil its mandate, the ECB needs to make use of all instruments at its disposal."[4]

Figure 1. Inflation: HICP and HICP excl. food and energy, 1999-2014 (yoy% change)



Source: ECB, 2015

3 Although HICP inflation was on a decreasing path, prices excluding food and energy remained fairly stable in 2014. This reflects the fact that declining oil prices played a major role in the decline of inflation.

4 See https://www.ecb.europa.eu/home/html/faqassetpurchaseprogramme.en.html.

From March 2015 onwards, up to €60 billion of public and private sector securities will be purchased each month until end-September 2016 under this expanded programme. The ECB announced that the purchases would "in any case be conducted until we see a sustained adjustment in the path of inflation which is consistent with our aim of achieving inflation rates below, but close to, 2 per cent over the medium term." The securities, euro-denominated investment-grade securities issued by euro area central governments, agencies and European institutions, will be bought in the secondary market. The amount of government bonds bought will be based on the Eurosystem NCBs' (National central banks) shares in the ECB's capital key. Importantly, there will be two limits. First, there is an issuer limit of 33 per cent. This means that the Eurosystem will not buy more than one third of each issuer's debt. This limit implies that Greek bonds cannot be purchased until some time in the summer of 2015 when the redemption of some bonds held by the ECB will reduce the ECB holdings below the 33 per cent level.[5] Second, there is an issue limit, which is 25 per cent. This limit implies that the Eurosystem will not buy more than 25 per cent of each issue of a particular security. The maturities of the securities to be purchased will range between 2 and 30 years. NCBs will play a key role in implementing the program, while the ECB will coordinate the purchases.

Risk sharing under QE

To explain risk sharing under QE, we first have to explain capital keys. The ECB has its own capital, subscribed by the NCBs in all Member States of the European Union (EU). Each NCB accounts for a fixed percentage of this total capital and this percentage is called the capital key. The key is calculated according to the relative size of a Member States' population and gross domestic product. In effect the ECB is owned by all NCBs in the EU. When a country joins the EU, its central bank automatically becomes a member of the European System of Central Banks (ESCB). That means it is immediately factored into the calculation of the capital key. This last happened in July 2013, when Croatia became the 28th Member State of the EU. However, there is an important difference between NCBs from EU Member States that are part of the euro area and those that are

5 There is, however, another criterion that could imply that Greek government bonds will not be purchased, namely that "during reviews in the context of financial assistance programmes for a euro area Member State, eligibility would be suspended and would resume only in the event of a positive outcome of the review."

not. Only NCBs in the euro area have to pay up the full amount of capital according to the capital key. At the beginning of 2015, the 19 central banks of the euro area together paid up around €7.6 billion in capital to the ECB (see Table 1). The ECB's total capital amounted to €10.8 billion. The other members of the ESCB are obliged to pay only 3.75 per cent of their share in the ECB's subscribed capital, to help cover the ECB's running costs. This distinction also has an effect on the share that NCBs take of the ECB's gains or losses. When the ECB makes gains or losses in a given year, these are passed on to the NCBs in line with their capital key, after deduction of a safety buffer. However, the gains and losses arising from the Eurosystem's (the ECB and the NCBs of the countries in the euro area) monetary policy operations are distributed only to those central banks which have paid up their subscribed capital in full – i.e. the NCBs of the countries in the euro area (see Article 33 of the Statute of the European System of Central Banks and of the European Central Bank).

It is important to realise, however, that apart from this rule, the ECB's Governing Council, in accordance with the Statute of the ESCB, decides the way in which and the extent to which losses incurred by national central banks are shared within the Eurosystem. Although the "default mode is a full risk-sharing mode", as pointed out by ECB-President *Draghi* in his January 2015 press conference, there is no automatic loss-sharing rule.

Indeed, risk sharing under QE will be different than under other monetary policy operations. The Governing Council decided that purchases of securities of European institutions (which will be 12 per cent of the additional asset purchases, and which will be purchased by NCBs) will be subject to loss sharing. Furthermore, the ECB will conduct and hold 8 per cent of the additional asset purchases. This implies that 20 per cent of the additional asset purchases will be subject to a regime of risk sharing. Although risk sharing is thus different under QE, it is not the first time that the Governing Council decided to deviate from full risk sharing as President *Draghi* pointed out in his press conference.

According to the ECB (2015, p. 18), "the chosen regime ensures the effectiveness of sovereign bond purchases by mitigating concerns relating to moral hazard, thereby preserving incentives for prudent fiscal policies and the necessary structural reforms." As NCBs will bear most of the potential losses, governments will be less tempted to have others pay for the costs of delaying economic reforms and fiscal adjustments than under full risk-sharing.

Table 1. Capital share and paid up capital of central banks in the euro area

Central bank from:	Capital key (%):	Paid-up capital (EUR mln):	Share of fully paid capital (%):
Austria	2.0	213	2.8
Belgium	2.5	268	3.5
Cyprus	0.2	16	0.2
Estonia	0.2	21	0.3
Finland	1.3	136	1.8
France	14.2	1,535	20.1
Germany	18.0	1,948	25.6
Greece	2.0	220	2.9
Italy	12.3	1,333	17.5
Ireland	1.2	126	1.6
Latvia	0.3	31	0.4
Lithuania	0.4	45	0.6
Luxembourg	0.2	22	0.3
Malta	0.1	7	0.1
Netherlands	4.0	434	5.7
Portugal	1.7	189	2.5
Slovakia	0.8	84	1.1
Slovenia	0.3	37	0.5
Spain	8.8	957	12.6
Total	70.4	7,620	100

Source: ECB, 2015 (https://www.ecb.europa.eu/ecb/orga/capital/html/index.en.html)

Transmission channels and risks

When he announced QE, ECB President *Draghi* said: "Looking ahead, today's measures will decisively underpin the firm anchoring of medium to long-term inflation expectations. The sizeable increase in our balance sheet will further ease the monetary policy stance. In particular, financing conditions for firms and households in the euro area will continue to improve. Moreover, today's decisions will support our forward guidance on the key ECB interest rates and reinforce the fact that there are significant and increasing differences in the mon-

etary policy cycle between major advanced economies. Taken together, these factors should strengthen demand, increase capacity utilisation and support money and credit growth, and thereby contribute to a return of inflation rates towards 2 per cent." According to the ECB (2015, p. 12): "Supported by the ECB's monetary policy measures, the expected recovery in demand and the assumption of a gradual increase in oil prices in the period ahead, inflation rates are expected to increase gradually later in 2015 and in 2016."

The Eurosystem will buy bonds in the secondary market against central bank money, which the institutions that sell the securities can use to buy other assets and extend credit to the real economy. How might that affect the real economy and inflation? What are the risks?

Bank lending channel

If the ECB buys assets from banks, they receive central bank reserves in return. This may lead to extra lending if the main reason for low credit growth in the euro area is that banks are liquidity constrained (and not lack of demand for credit). This channel is potentially important in the euro area, given the dominance of bank lending in monetary transmission. However, it may not be very effective in current circumstances, since most banks are not liquidity constrained, as they have unlimited access to central bank liquidity at a fixed interest rate in the refinancing operations of the Eurosystem (through the so called fixed rate full allotment operations). Moreover, at the zero lower bound the opportunity costs of liquidity reserves are low, which makes an expansion of base money less effective in stimulating credit supply and the economy (*Van den End*, 2014). Since June 2014 the deposit rate of the ECB has become negative. This could be an incentive for banks to use their excess liquidity in lending activities.

QE could also improve the capital position of banks, as they could sell assets to the ECB and realize valuation gains and capital relief. By this the ECB would – indirectly – give solvency support to banks. Capital relief is most likely if banks sell private sector securities to the Eurosystem. Such securities, like asset-backed securities, usually have higher risk weights than sovereign bonds.

QE might also lower lending rates if it reduces the funding costs of banks. This will be effective if high funding costs are a main determinant of loan rates. However, evidence suggests that this is not the case (*DarracqPariès et al*., 2014). The spread between funding and loan rates is dominated by charges for capital costs, macro and borrower risks, which relate to structural problems at banks and firms.

Signalling channel

The signalling channel captures the impact of QE on expected future interest rates. It is the key channel in theoretical (New-Keynesian) models through which unconventional monetary policy influences the economy. It is effective if the central bank is committed to raising inflation expectations (*Krugman*, 1998) and to keeping the interest rate low for a prolonged period of time (*Eggertson and Woodford*, 2003). The instrument to influence expectations is communication in the form of forward guidance. By introducing QE (with a long horizon) the central bank may signal that it is committed to raising inflation expectations, thereby reinforcing the effect of forward guidance. In the New-Keynesian view, QE without a firm commitment to change expectations has no impact. Only if QE is interpreted by market participants as a commitment to higher inflation expectations it would work. The ECB has communicated that the intention is that the asset purchases would in any case be conducted until there is a sustained adjustment in the path of inflation, consistent with inflation rates below, but close to, 2 per cent over the medium term.

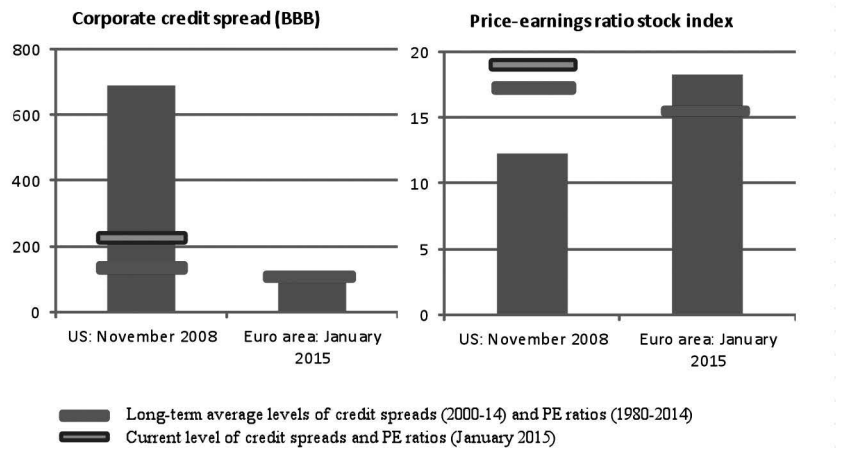
Portfolio rebalance channel

Asset purchases by the central bank can stimulate riskier and longer-term investments, by changing the relative supplies of assets and the composition of investment portfolios. This channel works because preferred-habitat investors will react by readjusting their portfolios. Investors will only do this if the liquidity they receive is an imperfect substitute for the assets sold. In that case they will search for other assets which are a closer substitute to the assets sold. This process will raise the price of assets not purchased by the central bank as well.

If portfolio adjustments lead to higher asset prices, it will increase aggregate demand and inflation through wealth effects. Wealth effects are potentially important in the euro area – a 10% increase in financial wealth leads to an increase of between 0.6% and 1.5% in consumption in the long-run (*Sousa*, 2009) – although they are less certain at the current juncture due to balance sheet constraints of firms and households. It is also not likely that under current circumstances the portfolio rebalancing channel works well in the euro area, where financial fragmentation and balance sheet constraints can make investors reluctant to shift investments across the risk and maturity spectrum.

Moreover, asset prices look increasingly stretched, which has reduced the scope for further increases, without the risk of bursting bubbles at a later stage and subsequent negative wealth effects. Credit spreads in the euro area have fallen sharply since 2012 (below their long-term average) and stock prices have boomed, raising price-earnings ratios above their long-term average (see Figure 2). This sharply contrasts with the adverse market conditions in which the Fed launched QE1 in November 2008, which had the strongest market impact. To some extent the favourable market conditions in the euro area may reflect that QE has already been priced in by investors in the course of 2014.

Figure 2. Financial markets conditions at the start of QE



Exchange rate channel

By loosening monetary conditions, the euro exchange rate could weaken as a result of QE. This may occur in reaction to the expectation that the interest rate will remain low for a prolonged period of time. However, a large-scale asset purchase program could also encourage capital inflows to the euro area, as the ECB provides an implicit put on asset prices. This could – together with improving growth prospects – lead to an appreciation of the euro. Hence, quantifications of the exchange rate channel remain highly uncertain. Still, it seems that at least in the short run the recent depreciation of the euro may enhance demand through higher exports and increase inflation by raising import prices. Of course, this depreciation was already under way before the ECB's Governing Council announced QE. However, this may reflect that financial markets increasingly ex-

pected monetary policies in the US and the euro area to diverge. The euro depreciated further when the ECB decision on QE was announced.

The depreciation of the exchange rate can be an important channel to raise economic growth and inflation. A simulation with the macroeconomic model NiGEM[6] shows that the pure pass-through effect of the recent depreciation of the euro – a 5.5% depreciation of the nominal effective exchange rate between mid-October 2014 and mid-February 2015 – could raise euro area economic growth by 0.4 percentage points in 2015 and 0.6 percentage points in 2016. The pass-through effect on inflation (measured by the personal consumption deflator) is strong, adding up to 1.6 percentage points to the inflation rate in 2015 and 1.3 percentage points in 2016. These results should be interpreted as forming an upper bound on possible growth and inflation effects, as the simulation assumes unchanged policy rates in major trading partners. Nevertheless these results suggest that in the short run the exchange rate channel could contribute to the objectives of QE. And these effects in turn might stimulate private sector demand.

QE in the US and the UK

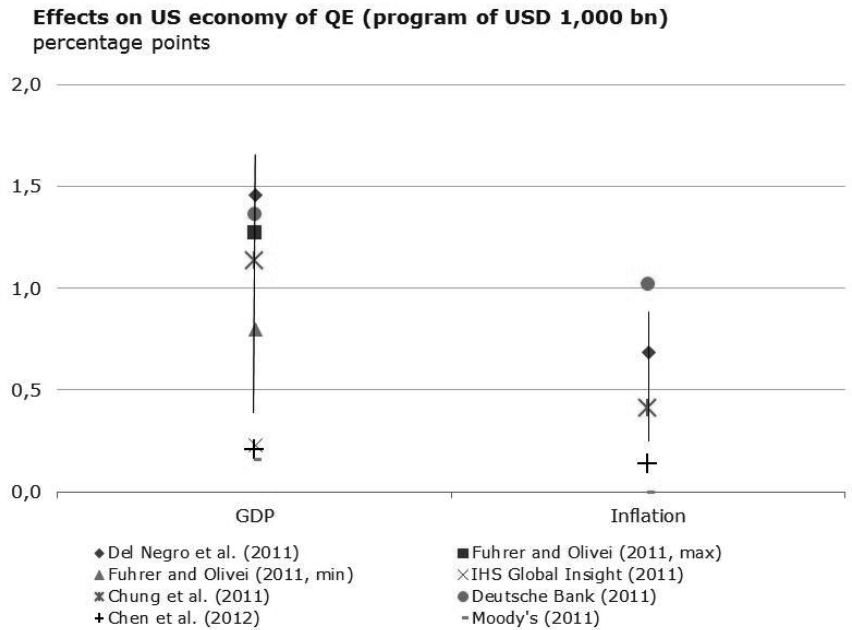
Research for the US and UK show that QE programs have had substantial effects on financial markets. Credit spreads and government bond yields have declined by several tenths to more than hundred basis points and stock prices have risen (see, for instance, Joyce et al., 2012, Gilchrist et al., 2014). These effects mainly stem from the portfolio rebalancing and signalling channels. Estimates of the effects on the economy and inflation are more uncertain. They range from insignificant, to more than 1.5 percentage points for a QE program equivalent to USD 1,000 billion in the US (see Figure3). *Moessner* (2013) finds that asset purchase announcements by the Fed contributed marginally to inflation expectations in addition to forward rate guidance.

The effectiveness of QE on aggregate demand in the euro area is uncertain. First, banks, households and firms are still de-leveraging, which will make them reluctant to issue or take new credit or to spend. Second, QE1 of the Fed was particularly effective because of the adverse market conditions in 2008-09. The euro area currently faces a strong risk-on environment and interest rates and credit

6 See http://nimodel.niesr.ac.uk. The model of the British National Institute of Economic and Social Research uses a 'New-Keynesian' framework in that agents are presumed to be forward-looking and there are nominal rigidities. Unlike a pure DSGE model, NiGEM is based on estimation using historical data.

spreads are already extremely low. This means that the market conditions at the start of QE in the euro area are very different from those in the US at the time of QE1. This makes it likely that the potential effects of QE in the euro area will be smaller. And lastly, the financial structure of the economy in the euro area differs from the US. The latter is a market-based economy, while the euro area can be characterised as a largely bank-based economy. Since QE mainly works through financial market channels, the effects in the euro area will likely be smaller than in the US.

Figure 3. Macro-economic effects of QE in the US



Risks of QE

QE poses several risks. By encouraging risk-taking by market participants, QE could create financial imbalances that are out of line with economic fundamentals. For instance in the UK and US, stock prices rose strongly after announcements of new QE programs. In the euro area, risk-taking in financial markets and the real economy are out of sync,as the confidence of financial investors is much higher than that of manufacturers (as shown by recent confidence indicators).

Another risk of QE is that by prolonging very loose monetary conditions, it may lead to a misallocation of resources. For instance, by discouraging write-downs of loans that would not be profitable in normal market conditions. And last but not least, large-scale central bank interventions on financial markets reduce market discipline and take away incentives for governments and private entities to conduct fundamental adjustments. Since investors seem to price in an improvement of economic fundamentals, this constellation raises the risk of sharp reversal in financial market prices if fundamental changes fail to occur.

Conclusions

By announcing an expanded QE program in January 2015, the unconventional monetary policy of the ECB has taken a new direction. It follows similar programs in Japan, the UK and the US, but its modalities are specific to the euro area. The ECB program involves limited risk sharing among the central banks in the Eurosystem and it is particularly aimed at raising inflation expectations. The effectiveness of the expanded asset purchase program is, however, uncertain. The program can work through various channels. Since market conditions at the start of QE, as well as underlying economic and financial structures, differ, the effects of QE in other countries cannot be directly projected on the euro area. The biggest effect on economic growth and inflation will probably come from the depreciation of the euro exchange rate. Still, since the overall effects remain uncertain we conclude that the jury on the expanded asset purchase programme of the ECB is still out.

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