

Gern, Klaus-Jürgen; Jannsen, Nils; Kooths, Stefan; Wolters, Maik

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Klaus-Jürgen Gern, Nils Jannsen, Stefan Kooths and Maik Wolters*

Quantitative Easing in the Euro Area: Transmission Channels and Risks

The ECB's recently launched Expanded Asset Purchasing Programme is similar to the quantitative easing programmes undertaken by the US Federal Reserve, the Bank of England and the Bank of Japan. While theory suggests that quantitative easing can stimulate economic growth and spur inflation via several transmission channels, the empirical evidence is ambiguous and does not support strong stimulating effects, in particular for the current situation in the euro area. In addition, there are various risks and unintended consequences that may materialise in the medium or long run.

In the aftermath of the global financial crisis, policy interest rates in many advanced economies reached the zero lower bound, making conventional monetary policy increasingly impotent. In order to ensure financial stability, price stability and economic growth, central banks increasingly utilised unconventional policies, including quantitative easing (QE) through large-scale asset purchases. QE is generally defined as an instrument of unconventional monetary policy that increases the monetary base via massive open market operations, e.g. by large-scale asset purchase programmes.

On 22 January 2015, the European Central Bank (ECB) announced a comprehensive QE programme providing for €60 billion worth of monthly purchases of private and public sector securities for an extended period of time. The major share of this Extended Asset Purchase Programme (EAPP) includes purchases of bonds issued by the central governments of euro area countries, agencies

and European institutions (the so-called Public Sector Purchase Programme, PSPP). The PSPP was launched in March 2015 and is intended to be carried out until at least the end of September 2016, conditioned on the achievement of a sustained adjustment in the path of inflation that is consistent with the ECB's definition of price stability.¹

QE programmes can affect economic activity through various channels, including the interest rate channel, the signalling channel and the exchange rate channel. Since the announcement of the programme, the euro has devalued by around ten per cent in effective terms. Long-term interest rates initially declined, although this was from already low levels, and they have recovered more recently. It is, however, too early for an assessment of the effects of the QE programme on the euro area economy. In the following, we discuss the potential effects of ECB's QE programme by drawing lessons from the experience with recent QE measures carried out by the US Federal Reserve (Fed), the Bank of England (BoE) and the Bank of Japan (BoJ). We describe how QE works in theory and discuss empirical results concerning the effects of QE. We focus not only on the potential gains of QE but also discuss the potential costs. We also describe the relevant differences between the euro area and other countries that have experimented with QE. We start by briefly describing the QE policies undertaken by the other major central banks, with reference to the policies pursued at the same time by the ECB.

Klaus-Jürgen Gern, Kiel Institute for the World Economy (IfW), Germany.

Nils Jannsen, Kiel Institute for the World Economy (IfW), Germany.

Stefan Kooths, Kiel Institute for the World Economy (IfW), Germany; and Business and Information Technology School (BITS), Berlin, Germany.

Maik Wolters, Kiel Institute for the World Economy (IfW), Germany; and Kiel University, Germany.

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¹ See M. Draghi: Introductory statement to the press conference (with Q&A), Frankfurt am Main, 22 January 2015.

QE in the US, the UK and Japan

Since the onset of the global financial crisis, the central banks in major advanced economies (the United States, the United Kingdom, Japan, euro area) have increased their balance sheets massively.² While the ultimate goals of monetary policy – initially the provision of liquidity to the markets in order to ease financial market stress and financing constraints in the economy, and later the stimulation of the economy and inflation – were more or less the same, there were fundamental differences in the strategies of the Fed and the BoE on the one hand and the BoJ and the ECB on the other hand.³ Whereas the first programmes of the Fed and the BoE already concentrated on outright asset purchases (first-round QE programmes), the BoJ and the ECB in the initial phase concentrated instead on direct lending to banks. This difference was motivated by the fact that bond markets are relatively more dominant in the former countries while bank lending is the prevalent source of financing in the latter.

New QE measures were initiated in the US, the UK and Japan (second-round QE programmes) beginning in the second half of 2010. While serious financial market disorder had receded by then, economic activity had remained sluggish, and improvement in the labour markets was disappointingly slow. The Fed announced an additional \$600 billion of US treasuries purchases (QE2). In September 2012, the Fed implemented a change in strategy with the introduction of its QE3 programme, in which it committed to the pace of purchases (rather than a total quantity). The pace was set at \$85 billion per month, which was maintained until the start of tapering in December 2013. The BoE stepped up its asset purchases programme in two steps from £200 billion to £375 billion. The BoJ reacted to the challenges posed by the natural and nuclear disasters in 2011 and the following economic woes by stepping up its lending programmes and increasingly engaging in asset purchases. As part of the new government's three-pronged anti-deflationary policy approach (referred to as "Abenomics"), the BoJ in April 2013 announced that it would increase its monthly asset purchases such that it would double the monetary base within two years.

² For a comprehensive account of QE policies in the US, Japan, the UK and the euro area in the aftermath of the global financial crisis, see B.W. Fawley, C.J. Neely: Four Stories of Quantitative Easing, in: Federal Reserve Bank of St. Louis Review, Vol. 95, No. 1, pp. 51-88.

³ The BoJ previously used QE between 2001 and 2006 in order to stimulate the economy in a situation where the policy rate was already close to zero. The BoJ temporarily changed its main operating target from the uncollateralised overnight call rate to the outstanding balance of so-called current accounts, i.e. banks' excess reserves. With corresponding purchases of public and private debt, this policy resulted in an expansion of the monetary base by around 30 per cent over the next four years.

The ECB launched several unconventional policy programmes in response to the European sovereign debt crisis and generally sluggish economies, with the aim of keeping those market segments afloat that seemed to be dysfunctional and supporting the monetary policy transmission mechanism. The measures included the Securities Markets Programme (SMP), a further round of covered bond purchases, the provision of additional 12-month longer-term refinancing operations (LTROs), and finally the auction of 36-month LTROs. Although these measures inflated the ECB's balance sheet by more than 50 per cent between September 2011 and January 2012, they cannot be regarded as QE in the narrow sense.⁴ As the main tool of unconventional monetary policy easing was the fixed-rate tender/full-allotment policy, monetary base developments have to a large extent been driven by the demand of banks for liquidity rather than by the supply of funds generated through asset purchases, and they have insofar been endogenous. This aspect is reflected in the decline of the monetary base of the euro area in 2013/14, which came about without any explicit tightening of monetary policy.

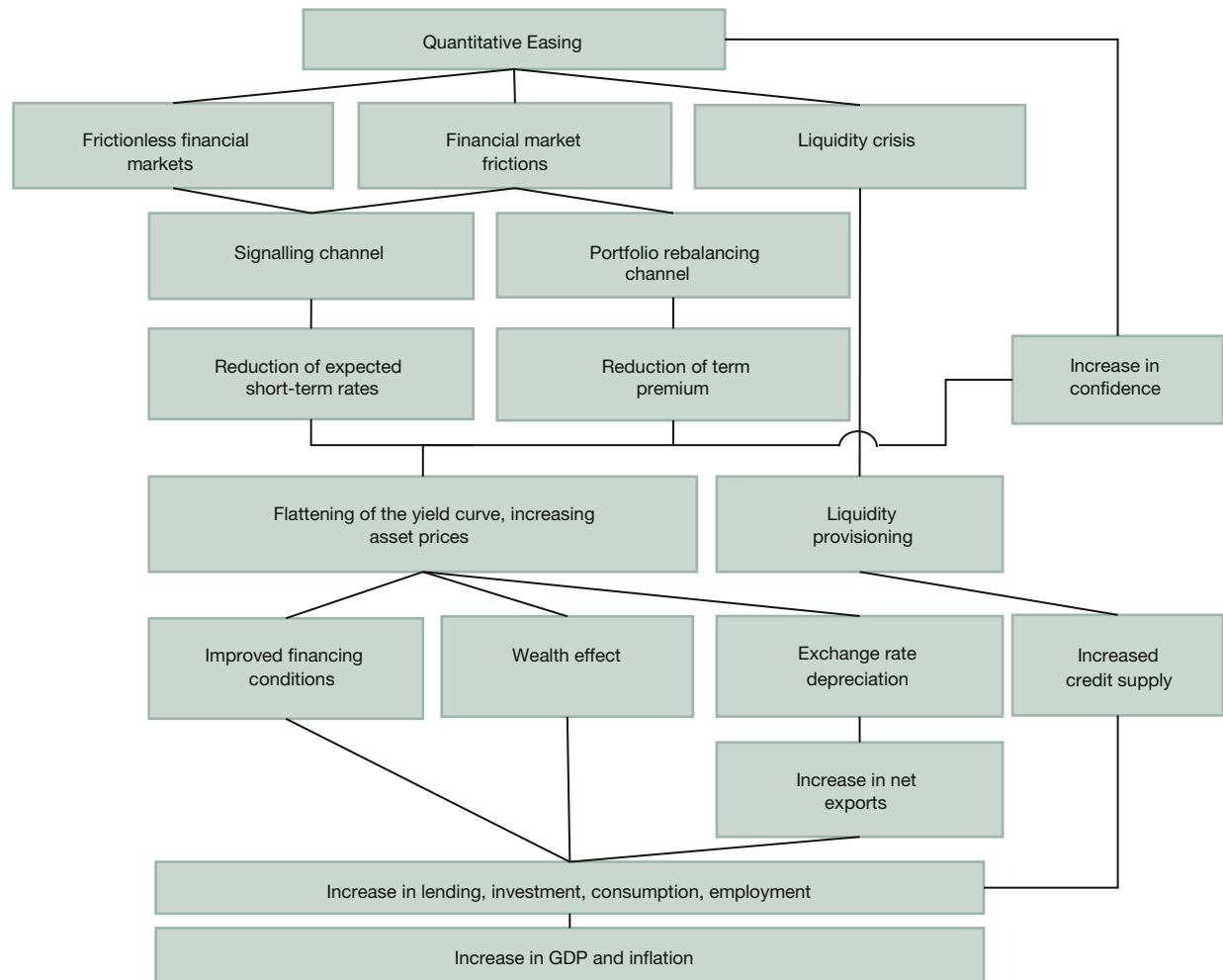
Transmission channels from economic theory

The purpose of QE is to bring inflation and inflation expectations in line with the central bank's target, stimulate economic growth, and lower unemployment. QE programmes are designed to positively affect the economy by lowering interest rates and devaluing the currency. There are various transmission channels for QE. The two most prominent ones are the signalling and the portfolio rebalancing channels (Figure 1). Both are mainly targeted at lowering long-term interest rates. There are two primary factors that affect long-term interest rates: first, expectations about future short-term interest rates, and second, the term premium. The signalling channel affects the former, while the portfolio rebalancing channel affects the latter.

The signalling channel is closely related to the forward guidance communication strategies that central banks have used recently to influence the expectations of market participants regarding future short-term interest rates. With forward guidance, the central bank announces that it intends to keep short-term interest rates low for an extended period of time. In this context, QE strengthens the credibility of the central bank to keep in-

⁴ Although the SMP allowed the ECB to purchase government debt in the secondary market, this cannot qualify as QE because the scope and size of the interventions were not pre-announced and the asset purchases were sterilised so that the monetary base would not increase as a result and the overall monetary stance would not be affected.

Figure 1
QE and its transmission channels



Source: Kiel Institute for the World Economy.

terest rates low for a prolonged period of time because an earlier exit from this strategy would trigger losses for the central bank. Large-scale asset purchases may also be interpreted by market participants as a signal of how bad the economic situation really is and that extraordinarily expansionary monetary policies will be in place for some time to come.⁵

The portfolio rebalancing channel works if short-term and long-term bonds are imperfect substitutes. In this case,

the relative supply of short-term and long-term bonds affects the yield curve. By purchasing long-term government bonds, the central bank lowers the term premium of these bonds. Via arbitrage processes the returns on similar assets are also affected. In addition, falling returns may induce some investors to switch to riskier assets with higher yields, putting pressure on those yields as well. Alternatively, central banks can directly buy private sector assets (e.g. asset-backed securities, mortgage-backed securities, corporate bonds). These assets are obviously imperfect substitutes for both money and government bonds, as they typically represent more risky investments. Central bank purchases of private sector assets directly reduce market risk premiums.

⁵ M.D. Bauer, G.D. Rudebusch: Monetary Policy Expectations at the Zero Lower Bound, Federal Reserve Bank of San Francisco Working Paper, 2013-18.

QE may also lead to a depreciation of the exchange rate, e.g. if it is successful in lowering interest rates, and thereby may stimulate the economy via a third transmission channel. Provided that these transmission channels are strong enough to significantly stimulate GDP, QE may contribute to price increases and hence to an increase in inflation. To the extent that these effects are anticipated, expected inflation might increase immediately without a time lag, which also would lead to an instantaneous reduction in the *ex ante* real interest rate. All these channels may also have confidence effects by improving the economic outlook, reducing uncertainty and lowering financial market volatility, particularly in times of financial market distress. Strengthened business confidence may encourage investment spending directly and may also contribute to a decline in risk premiums.

Empirical evidence from the US, the UK and Japan

Empirically disentangling the QE-induced effects from other causes of fluctuations in interest rates is challenging. The analysis of announcement effects and model-based estimations are the main approaches used in applied empirical research. Announcement effect studies report the variation in long-term interest rates within a brief window of time around a central bank announcement. These studies assume that markets are efficient in the sense that all the effects on yields occur when market participants update their expectations and not when actual purchases take place. This approach is, however, problematic for evaluating QE measures that have been anticipated by market participants prior to the official announcement. A second approach uses time series analysis (on a monthly or quarterly basis). Typically, long-term yields or estimates of the term premium are regressed on the net supply of long-term bonds or other assets included in a QE programme. The estimated parameters measure the effect of QE on long-term rates. Other factors that explain interest rates are included as control variables in the regression. This approach also suffers from identification problems if the anticipation of QE already affects rates before the actual purchases of assets by the central bank via expectation formation. Hence, empirical estimates regarding the effects of QE have to be interpreted cautiously.

Almost all studies find that QE will reduce long-term interest rates. However, the magnitude of this reduction differs widely across studies and the results show a large degree of uncertainty. All in all, the studies indicate that a QE programme equivalent to a \$600 billion asset purchase programme in the US will lower long-term interest

rates by 0.15 to 0.25 percentage points.⁶ Comparing this to conventional policy measures, similar effects could be reached by lowering the short-term policy rate by 0.75 to 1.0 percentage points.⁷ In addition, studies that analyse exchange rate effects find that QE leads to a depreciation of the domestic currency against other major currencies. Studies focusing on Japan and the UK find similar results.⁸ While the above results indicate that QE lowers the yields of government bonds and other assets, there is more ambiguity regarding the transmission channels and the persistence of the reductions in yields. For the US and the UK, a number of studies emphasise the relative importance of the portfolio rebalancing effect, but a similar number of studies find an important role for the signalling channel. In contrast, most empirical studies of Japan find evidence of transmission of QE mainly via the signalling channel. Regarding the persistence of QE effects, some authors find only temporary effects,⁹ while others report evidence for persistent effects.¹⁰

The macroeconomic effects of QE are even more difficult to assess than the effects on interest rates, as there may be considerable transmission lags, making it difficult to disentangle the QE-specific impact from other impacts. There are two main approaches. The first is to use theory-based macroeconomic models. This approach is challenging because standard macroeconomic models are usually based on frictionless financial markets and need to be adjusted to include financial market frictions in order to allow the analysis of both the signalling channel and the portfolio rebalancing channels. The second approach uses unrestricted, purely empirical methods like vector autoregressions. The results of all of these studies are even more uncertain than those regarding the effects of QE on the interest rate. The Fed's QE1 and QE2 programmes increased GDP between 0.3 and three per cent and infla-

6 J.C. Williams: Monetary Policy at the Zero Lower Bound: Putting Theory into Practice. Hutchins Center on Fiscal & Monetary Policy at Brookings, 16 January 2014.

7 R.S. Gürkaynak, B. Sack, E.T. Swanson: Do Actions Speak Louder than Words? The Response of Asset Prices to Monetary Policy Actions and Statements, in: International Journal of Central Banking, Vol. 1, 2005, pp. 55-93.

8 For Japan, see the survey in H. Ugai: Effects of the Quantitative Easing Policy: A Survey of Empirical Analyses, in: Monetary and Economic Studies, Vol. 25, No. 1, 2007, pp. 1-48. For the UK, see M. Joyce, A. Lasoosa, I. Stevens, M. Tong: The Financial Market Impact of Quantitative Easing in the United Kingdom, in: International Journal of Central Banking, Vol. 7, No. 3, 2011, pp. 113-161.

9 J.H. Wright: What does Monetary Policy do to Long-term Interest Rates at the Zero Lower Bound?, in: Economic Journal, Vol. 122, No. 564, 2012, pp. F447-F466; H. Schenkelberg, S. Watzka: The Real Effects of Quantitative Easing at the Zero Lower Bound: Structural VAR-based Evidence from Japan, in: Journal of International Money and Finance, Vol. 33, No. C, 2013, pp. 327-357.

10 M. Joyce, M. Tong: QE and the Gilt Market: a Disaggregated Analysis, in: The Economic Journal, Vol. 122, No. 564, 2012, F348-F384.

tion between 0 and 1.0 percentage points.¹¹ In general, the effects of QE on GDP are found to be larger than on inflation. Further, the empirical evidence from several studies indicates that QE1 was more effective than QE2. QE1 was implemented during the most acute phase of the crisis. Hence, it might have had large effects via providing liquidity, restoring confidence and alleviating financial market distress by signalling that the Fed would decidedly combat possible tail risks based on lessons learned from the Great Depression. When QE2 was undertaken, financial market stress had already fallen substantially, so that a significant liquidity provisioning effect was unlikely and transmission via increasing market confidence played a smaller role. However, QE2 was also more highly anticipated by market participants than QE1, and thus event studies that narrowly focus on interest rate movements around the announcement date most likely underestimate the impact of QE2. While QE1 included the purchase of private sector assets, QE2 was restricted to government bonds. Hence, QE1 might have been more effective in reducing risk premiums. Determining which of these three factors was most important is hard to substantiate.

Among the vast empirical literature on the effects of QE, only few studies analyse the role of exchange rates. There is evidence that QE significantly depreciated the currencies in the US and the UK versus those of their major trading partners.¹² The size of the depreciation is similar to that following an equivalent conventional monetary policy shock. By contrast, no significant effect of the BoJ's QE measures on the yen has been found.¹³ Since the announcement of the ECB's QE measures on 22 January 2015, the euro has already depreciated substantially against the US dollar. At least part of this depreciation can probably be attributed to the ECB's QE measures.

Risks and unintended consequences

QE interventions are no “free lunch” but bear risks via unintended consequences.¹⁴ In a cost-benefit analysis,

these negative side effects show up as costs. As opposed to the short-run benefits that central banks expect from their QE programmes, most of the costs are likely to show up in the long run. They are also more diffuse and less concrete than the potential gains, making them even more difficult to quantify than short-run benefits. Most of the risks of QE are similar to those that stem from ultra-low interest rate regimes for a prolonged period of time. This follows from the fact that QE aims to bring market interest rates further down once central banks have reached the zero lower bound. In addition, QE can be interpreted as a credible central bank commitment to leave interest rates at ultra-low levels for an extended period of time to overcome the time inconsistency problems of forward guidance. However, there are also risks that are specific to QE strategies.

Firstly, expansionary monetary policy may contribute to excessive risk-taking, it fuels asset price bubbles and it increases systemic financial risks. It is well understood that ultra-low interest rates for an extended period of time stimulate risk-taking in financial markets.¹⁵ This is one of the transmission channels that make QE work. However, excessive risk-taking, in turn, increases systemic risk, fuels asset-price bubbles, and – in the worst case – triggers banking crises. Excessive risk-taking revealed by large financial imbalances, a massive credit expansion and housing price explosions was a key driver in the run-up to the global financial crisis.¹⁶ These risks of extraordinarily expansionary monetary policy tend to increase the longer the policy is in place.¹⁷ It is unlikely that macroprudential policies can shield an economy completely from such risks, because regulators inherently lag behind market developments.

Secondly, the exit from ultra-easy monetary policy and QE may be extremely difficult. In theory, there are several instruments to exit from ultra-easy monetary policy and to avoid runaway credit creation and inflation. In practice, however, there are very limited experiences with exits when the balance sheets of central banks are extremely large, and central banks will most likely face severe problems on their way to normalising monetary policy. These problems include the timing of the exit, massive price adjustments of fixed-interest securities and conflicting policy goals (in particular financial stability vs. price stability).

11 H. Chung, J.-P. Laforde, D. Reifschneider, J.C. Williams: Have We Underestimated the Probability of Hitting the Zero Lower Bound?, in: *Journal of Money, Credit and Banking*, Vol. 44, No. 2, 2012, pp. 47-82; H. Chen, V. Cúrdia, A. Ferrero: The Macroeconomic Effects of Large-Scale Asset Purchase Programmes, in: *The Economic Journal*, Vol. 122, No. 564, 2012, pp. F289-F315.

12 C.N. Neely: Unconventional monetary policy had large international effects, in: *Journal of Banking and Finance*, Vol. 52, 2015, pp. 101-111.

13 H. Schenkelberg, S. Watzka: The Real Effects of Quantitative Easing at the Zero Lower Bound: Structural VAR-based Evidence from Japan, in: *Journal of International Money and Finance*, Vol. 33, No. C, 2013, pp. 327-357.

14 For a comprehensive summary, see W.R. White: Ultra Easy Monetary Policy and the Law of Unintended Consequences, Federal Reserve Bank of Dallas Globalization and Monetary Policy Institute, Working Paper No. 126, 2012.

15 R.G. Rajan: Has Financial Development Made the World Riskier?, NBER Working Paper 11728, 2005.

16 M. Drehmann, C. Borio, K. Tsatsaronis: Characterising the financial cycle: don't lose sight of the medium term!, BIS Working Paper 380, 2012.

17 A. Maddaloni, J.-L. Peydro: Bank Risk-Taking, Securitization, Supervision, and Low Interest Rates: Evidence from the Euro-Area and the US Lending Standards, in: *Review of Financial Studies*, Vol. 24, No. 6, 2011, pp. 2121-2165.

Central banks would find themselves in a very difficult position if inflation picked up in a situation when a tightening of monetary policy would contribute to a sovereign debt crisis (due to increasing government bond yields), lead to recurring financial market distress (due to balance sheet problems of major financial market participants such as pension funds or life insurance companies) or might weaken the financial health of its own balance sheet. The longer ultra-low interest rates prevail, the higher is the share of low-yielding securities in the market. Once interest rates rise again, these securities will experience major price adjustments. As a result, the central bank may tolerate inflation rates above the bank's official target rather than risking new financial turmoil.

Thirdly, an ultra-easy monetary policy may lead to the misallocation of capital and it blocks necessary adjustment processes. Interest rate variations affect not only the level of investment but also the structure of investment and – as a result – of the capital stock that predetermines to a large extent the future production possibilities. The longer market interest rates are kept artificially low by monetary policy, the more investment decisions are guided by distorted interest rate signals. These distortionary effects were important factors behind the construction booms that took place in many economies (e.g. the US, the UK, Spain and Ireland) before the global financial crisis, as these booms were fuelled by low mortgage rates. Misallocation of real resources is not limited to the construction sector but can also occur in other sectors in which such misallocation might be even harder to identify. In a similar way, ultra-easy monetary policies tend to prevent or delay necessary adjustment processes. Ultra-low interest rates allow high debt burdens to be sustainable for the debtor. In such an environment, banks are tempted to continue financing firms that are basically insolvent, as the opportunity costs of non-performing loans decrease in low-interest rate environments (“evergreening”). This prolongs the life of “zombie enterprises” and “zombie banks” and continues directing scarce resources to insolvent, unproductive entities. There is evidence that evergreening and “zombie” structures were major problems for the Japanese economy in the aftermath of the 1990 banking crisis, preventing the necessary restructuring of the economy and thereby dampening potential growth.¹⁸

Finally, there is the risk that due to ultra-easy monetary policy, necessary policy actions for structural reforms are delayed. Central banks were successful in aggressively fighting financial market distress in the first phase of

the global financial crisis, and they supported economic growth considerably by lowering interest rates. The extraordinarily accommodative monetary policy was also largely perceived as buying time for economic policy to conduct necessary structural reforms. This is in line with conventional wisdom, given that monetary policy can generally respond much faster than governments do. Moreover, structural reforms, for example labour market reforms or consolidations of government budgets, can be extremely painful and usually take time to be implemented. However, the more time central banks buy, the less likely it becomes that necessary structural reforms will be taken. The greater the extent to which accommodative monetary policy stimulates the economy, the more it will conceal the real problems of the economy and the need for structural reforms will appear to be less urgent. This is less of a problem for the US and the UK, where the need for structural reforms is less apparent than it is in the euro area or Japan.

The situation in the euro area

The most obvious difference between the euro area and the US, the UK, and Japan is that it is a currency union consisting of national states with largely independent national governments. These governments pursue individual fiscal and financial policies, which leads to very different fiscal positions of the euro area countries. In this context, a QE programme that consists of buying government bonds further blurs the differences between monetary and fiscal policy, and the concern that the independence of the central bank is at risk when it buys large amounts of government bonds could be even more relevant for a currency union.¹⁹

Moreover, the financial system in the euro area is more bank-centric than its counterparts in the US and the UK. Given the relatively higher importance of bank credit in the financing of economic activity,²⁰ the ECB has initially chosen to directly support bank liquidity via its lending programmes. Thus, the macroeconomic effects of QE can be expected to be less pronounced than in the US or in the UK.

18 R.J. Caballero, T. Hoshi, A.K. Kashyap: *Zombie Lending and Depressed Restructuring in Japan*, in: *American Economic Review*, Vol. 98, No. 5, 2008, pp. 1943-1977.

19 It can be argued that the differences between monetary and fiscal policy have been blurred already by putting into place the Outright Monetary Transactions programme that allows the ECB to purchase unlimited amounts of government bonds under certain conditions, although bond purchases would not alter the monetary stance, as they would be fully sterilised.

20 Before the global financial crisis, the stock of outstanding bank loans to the private sector was 145 per cent of GDP in the euro area, more than twice as large as in the United States. See L. Bini Smaghi: *Conventional and Unconventional Monetary Policy*, Keynote lecture at the International Center for Monetary and Banking Studies, Geneva, 28 April 2009.

Furthermore, individual countries within the euro area are in very different economic states. While some countries are still suffering from large structural problems, high unemployment, or high private and public indebtedness, other countries are experiencing solid growth and strong labour markets. Monetary policy in the economically weak countries is likely to be less effective than in the economically strong countries. For the latter group, the monetary policy stance was arguably already very expansive even before the ECB implemented the EAPP, as judged by widely used measures to assess the appropriate stance of monetary policy, such as the Taylor rule. Additional monetary stimulus could increase the economic divergence further and generate numerous risks (e.g. asset price bubbles, excessive debt accumulation or systemic instabilities) in the countries with currently relatively healthy fundamentals.²¹

Finally, the current situation in the euro area is quite different from the situation in the US or the UK at the time of their first-round QE programmes because market interest rates are already very low and financial market distress has been alleviated. Given that QE is most effective when there is substantial scope for lowering market interest rates and when financial markets are distressed, the potential macroeconomic impact of QE in the euro area is very limited. The size of the effect can be expected to be comparable to the arguably less effective second-round QE programmes rather than with the first-round QE programmes that were introduced as a direct response to the unfolding global financial crisis.

Conclusions

The first-round QE programmes undertaken in the US and the UK were successful in restoring confidence in

the financial markets and in reducing uncertainty and financial stress. Given the high risk that the financial market turmoil would have intensified, leading the economies into much deeper recessions, these QE programmes can be regarded as successful.

By contrast, it is unlikely that the second-round QE programmes had large stimulating effects, as monetary policy is typically less effective in the aftermath of balance-sheet recessions. Moreover, the results of empirical studies indicate that the QE programmes were less effective when interest rates and financial market distress were already at very low levels. Taking a cost-benefit assessment point of view, it is difficult to argue that the second round of QE programmes was particularly successful.

In the euro area, QE will most likely be less effective in stimulating growth and raising inflation than it was in the US and the UK. The euro area's financial system is more bank-centric and the member countries are currently in very different economic conditions, making QE interventions less effective or even counterproductive (e.g. by stimulating those parts of the currency area that are already operating at normal capacity utilisation levels). In addition, when QE involves purchasing government bonds, problematic questions with respect to risk-sharing and the monetary financing of governments arise. While these aspects are irrelevant for the US or the UK, implicit cross-border fiscal transfers via the Eurosystem are a serious issue in the euro area, which is built on the principle of national fiscal sovereignty and the no-bailout clause that follows from it. At the same time, the risks of extraordinarily accommodative monetary policy (and thus QE) increase the longer the policy is in place, as it becomes ever more expansionary and monetary authorities advance further into uncharted territory. These risks are more likely to materialise in the medium term and are very difficult to assess quantitatively. However, this does not make them any less real.

²¹ This is a general problem of monetary policy in a currency union. However, it currently seems to be particularly severe, given the exceptional heterogeneity of the economic situation across euro area countries.