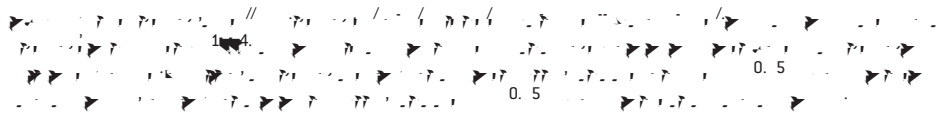
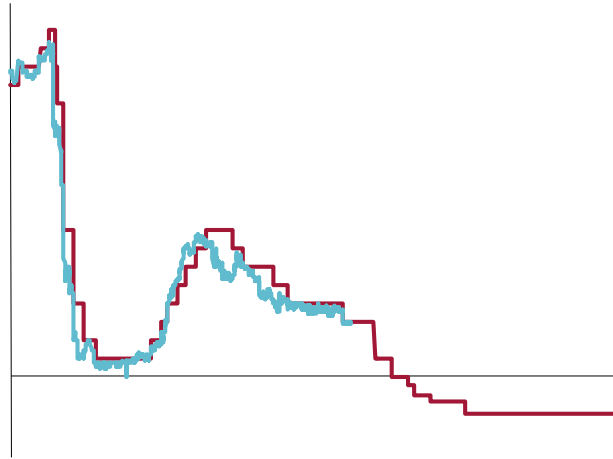

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This Policy Contribution was prepared for the Nomura Foundation's Macro Economy Research Conference: 'Monetary Policy Normalization Ten Years after the Great Recession', 24 October 2018, Tokyo. Financial support from the Nomura Foundation is gratefully acknowledged. The author thanks conference participants and Bruegel colleagues for useful comments and suggestions, and Bowen Call, Antoine Mathieu Collin and Catarina Midoes for excellent research assistance.



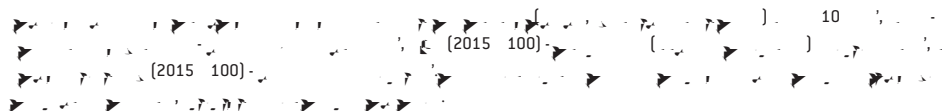
purchased large amounts of foreign currency to prevent the appreciation of the exchange rate of their currencies. These measures boosted the size of central bank balance sheets to unforeseen levels, at least since the second world war (Figure 2). While there were sizeable

Figure 3: Swedish interest rates (%), 2 January 2008 – 7 December 2018



Sweden is an open economy and external shocks, such as the global financial crisis which originated in the US, and the double-dip recession in the euro area, likely played major roles in the economic development of Sweden. Yet according to Svensson (2014), the premature monetary policy tightening also contributed to macroeconomic fluctuations: it led to high costs in terms of excessively low inflation, overly high unemployment and a higher real debt burden for households. Inflation fell quickly after 2011 and even in 2014 was close to zero, well below the 2 percent target (Figure 4). The unemployment rate also fell less rapidly than under a counterfactual scenario of continued low interest rates, suggesting that the premature monetary tightening pushed up the unemployment rate by about 2 percentage points for several years (Svensson, 2014).

Figure 4: Some key macroeconomic indicators of Sweden, 2000Q1 – 2018Q3



Ultimately, low inflation forced the Riksbank to cut rates to even lower levels: the repo rate was cut from 2 percent in July 2011 to -0.5 percent in February 2016. Moreover, the Riksbank also started to purchase Swedish government bonds for monetary policy purposes, starting in April 2015 with Swedish Krona 40-45 billion a month, increased to kr65 billion per month in October of the same year. However, although the Riksbank initially aimed to ward off the threat to financial stability of household over-indebtedness, the household debt-to-income ratio was not affected by the 2010-11 policy of tightening and in fact the ratio continued to increase in real terms, partly because of the very low inflation rates.

Furthermore, Riksbank interest rate guidance since 2011 turned out to have been inadequate. The Riksbank is among the few central banks to publish numerical forecasts for its main monetary policy rate (along with a confidence band). Only the 2010-11 tightening was in line with forecasts; Riksbank interest rate forecasts made both before and especially after this period, which predicted increases in the Riksbank's own interest rate, proved to be systematically wrong (Figure 5). These systematic forecast errors call into question the usefulness of the publication of interest rate forecasts.

Figure 5: The Riksbank's repo rate: actual and Riksbank forecasts (%), 2006Q1–2021Q3



government bond yield is also in contrast to the Riksbank's own prediction of a rate increase (Figure 5)³, suggesting the Riksbank's forward guidance is ineffective. We cannot exclude the hypothesis that market participants disregard the Riksbank's forward guidance because of the massive and systematic forecast errors made in the past.

Anyhow, the Swedish experience highlights that stopping net asset purchases would not necessarily lead to higher long-term interest rates.

These experiences offer important lessons to the European Central Bank:

- Premature tightening (when the evidence of an improved inflation outlook is not sufficiently strong) should be avoided; it is better to err on the side of a possible inflation overshoot after a long period of undershooting;
- A cautious approach to interest rate increases and balance sheet reductions could be justified when the inflation outlook is uncertain;
- Market participants might disregard forward guidance after large systematic forecast errors;
- Stopping net asset purchases might not lead to an increase in the long-term interest rate.

2.2 Federal Reserve: 'taper tantrum' unnecessarily pushed-up the 10-year yield

As the US economy gradually recovered from the deep recession of 2008-09, in December 2012 the Federal Reserve introduced a new way of forward guidance to communicate its ex-

have impacted government bond yield developments. The US experience was thus similar to the Swedish experience and suggests that stopping net asset purchases does not necessarily lead to a higher long-term interest rate.

Figure 6: US interest rates (%), 2 January 2000 – 6 December 2018

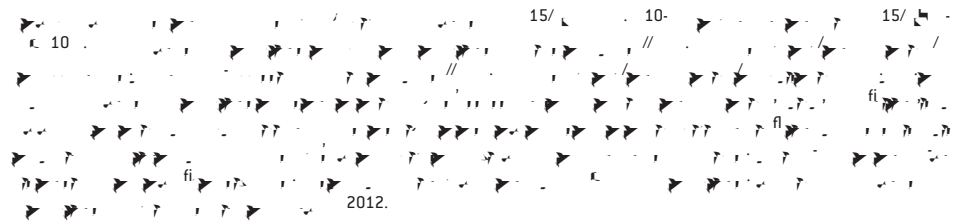
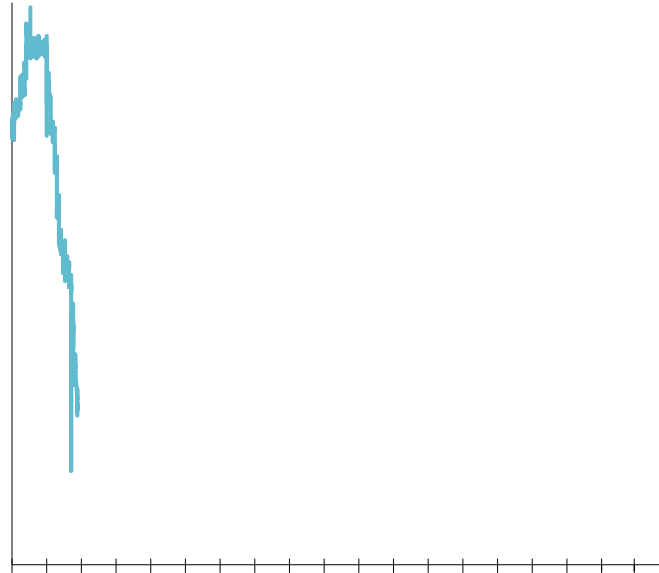


Figure 7: Some key macroeconomic indicators of the United States, 2000Q1 – 2018Q3

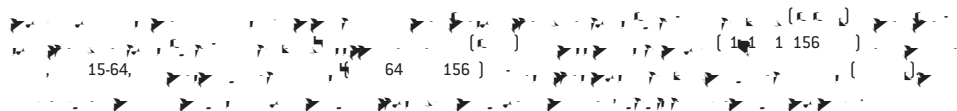
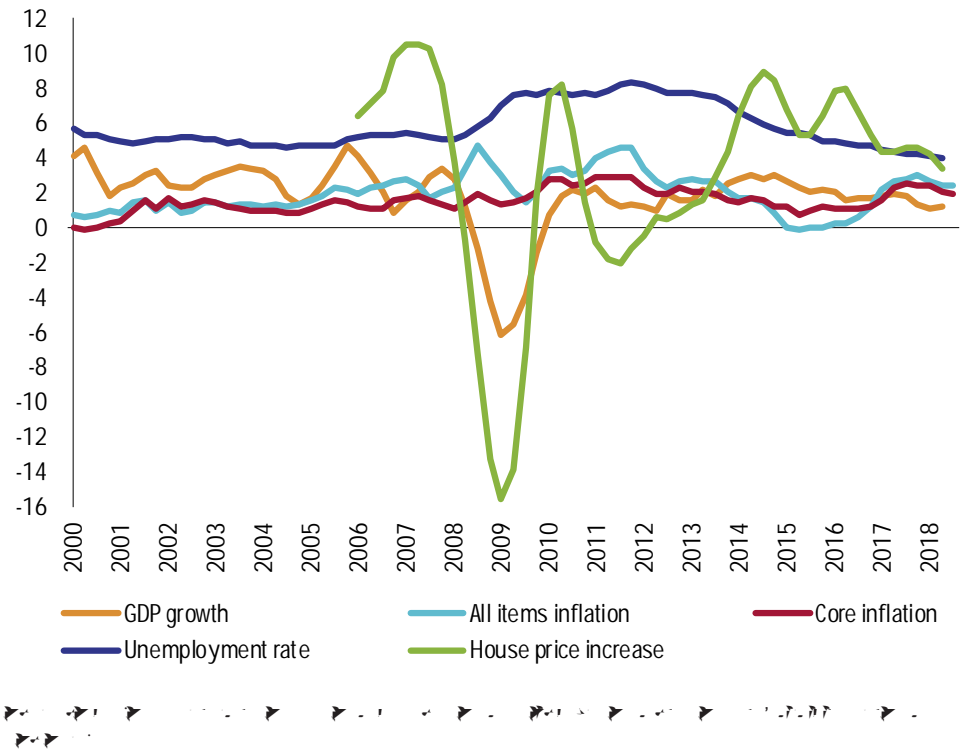
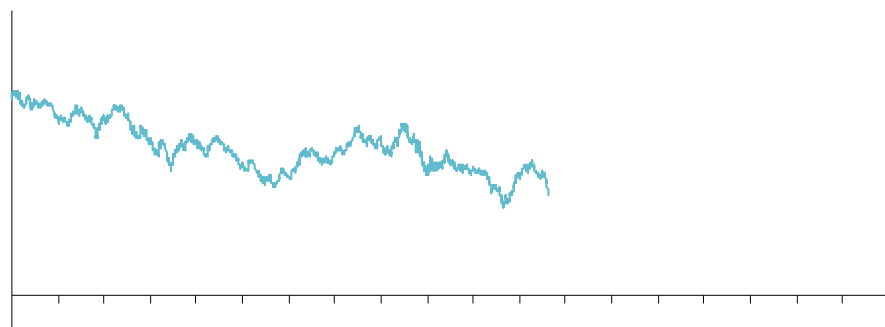


Figure 9: Some key macroeconomic indicators of the United Kingdom, 2000Q1 – 2018Q3



In terms of the actual exit from expansive policies in recent years, the UK experience has been quite similar to that of the US and Sweden: stopping net asset purchases hardly had an impact on long-term government yields, both after the third round of QE ended in November 2012 and the fourth (post-Brexit vote) round in March 2017. Even the actual 25 basis points interest rate increases by the Bank of England in November 2017 and August 2018 were not followed by any significant increase in long-term yields, similar to developments observed in the US after the first few interest rate hikes. However, in terms of more recent developments, the uncertain outlook around Brexit might also be playing a role in relation to market reactions.

Figure 10: ECB deposit facility interest rate and 10-year government bond yields of four countries (%), 2 January 2000 – 7 December 2018



Williams (2018) argued that although there is uncertainty about the natural rate and its expected evolution, it is reasonable to assume that it will remain low, not far from current levels, in the foreseeable future. This would have major implications for monetary policy. A lower equilibrium interest rate implies that in recessions the (effective) zero lower bound would likely be reached more frequently, limiting the impact of traditional interest rate policy (Claeys and Demertzis, 2017; Foldén, 2018; Williams, 2018). Thereby, unconventional monetary policy measures would be used more regularly, leading to larger central bank balance sheets than what was observed before 2008.

We note that this otherwise sensible argument applies to a kind of long-term average central bank balance sheet size, but is not very helpful as a guide for current monetary exit strategies. The argument implies that in future monetary easing periods, balance sheet instruments will be used more often, but it does not imply that in a monetary policy normalisation phase, the balance sheet cannot return to its previous level if deemed appropriate.

Yet the first question to answer is whether the central bank balance sheet should be reduced at all. Foldén (2018) and Claeys and Demertzis (2017) discussed several arguments in favour of larger central bank balance sheets. This can improve the monetary transmission mechanism, because the large liquidity surplus (large reserves of banks held at the central bank⁸), can mitigate the risk of friction on the money market. Larger central bank balance sheet can provide safe assets in the form of central bank liquidity. It can also reduce banks' incentives for excessive maturity transformation, which would make banking less risky.

But there are a number of arguments against a large central bank balance sheet too. Central bank asset holdings could alter market pricing mechanism. Large asset holdings can limit further asset purchases in a next monetary easing phase if the supply of assets is limited. It might expose the central bank to financial risk⁹

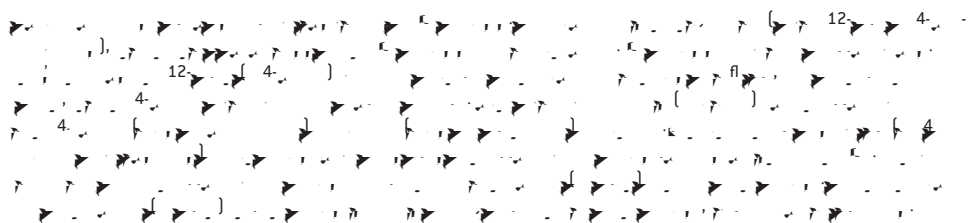
public) and the forecasts errors were rather significant. Similar conclusion applies to headline inflation, which was systematically over-predicted in 2014-16 (panel B). Since 2017, actual inflation has increased along with the forecast, but this was the outcome of two incorrect views: the forecast increase in core inflation (which has not happened) and the assumption of broadly unchanged energy prices (which have increased rapidly).

It is notable that while the ECB has over-predicted inflation developments, it has under-predicted GDP growth since 2014. That is, actual GDP growth has turned out to be systematically higher than ECB forecasts (panel C). This also implies that the underlying assumed relationship between growth and inflation was even more inaccurate: better than expected GDP growth should have resulted in higher than expected core and headline inflation, but in fact, core inflation (and also headline inflation for a number of years) has been significantly lower than expected.

Labour market forecasts are similarly characterised by large and systematic errors. The forecast errors of the unemployment rate (panel D) mirror the forecast errors of GDP: as GDP growth became better than expected, the unemployment rate also fell faster than expected, which are consistent developments. But the unemployment rate forecast errors highlight that the ECB's underlying Phillips curve assumption is flawed: faster than expected unemployment rate decline should have led to faster than expected rising inflation, but on the contrary, core inflation (and also headline inflation until 2016) turned out to be lower than predicted.

Wage forecasts also turned out to be grossly inadequate in 2013-16, though since 2017 wages have generally grown in line with predictions (panel E). Yet this particular recent wage growth forecast success is inconsistent with the faster than expected reduction in the unemployment rate and the lower than expected core inflation increase, highlighting the uncertainty of the underlying economic relationships assumed in ECB forecasting exercises.

Figure 12: ECB staff macroeconomic projections for the euro area, average annual values



Certainly, the ECB is not the only institution whose forecasts turned out to be incorrect. Many other central banks, international institutions and other forecasters made large forecasting errors even in the last five years, when economic conditions improved. Such forecasting failures should foster a general debate on forecasting practices. Yet the ECB's forecast errors and its inability to lift core inflation above 1 percent have major implications.

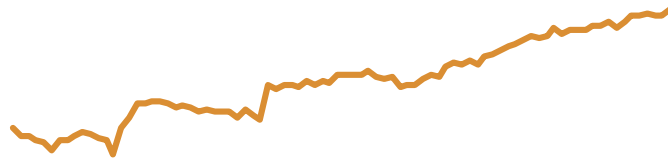
4.2 Can certain labour market factors explain the forecasting failures?

The labour supply in the euro area has increased for two main reasons:

- The labour force participation rate has been steadily increasing (Figure 13);
- Net immigration into the euro area was also substantial, and not just because of the major inflows of refugees in 2015-16.

An expanding labour force could put wages under downward pressure. If the ECB has persistently underestimated the expansion of the labour force, this factor could explain the persistent forecast errors in relation to wage and price increases. But such a persistent underestimation of labour force expansion is not consistent with the unemployment rate forecast errors, because faster than expected labour force growth should have resulted in larger than expected unemployment. But the opposite has happened.

Figure 13: Labour force participation rate (age 15-64, % of population), 1997Q1-2018Q2



employment to be consistent with stable, nonaccelerating, (wage) inflation (NAWRU)”, in

Table 1: Estimated real-time gap between the actual unemployment rate and the NAWRU (European Commission estimates)

	2018	
2013	1.3	2.6
2013		

in the early 2000s. Those part-time workers who wish to work full time could exert downward pressure on wage growth;

- The Phillips curve, which in its most basic setup measures the relationship between unemployment and wage growth, is found to become flatter in advanced countries (Ku-

selves should not be enough to justify a rate increase. A rate increase is only recommended

Such a cautious monetary policy exit strategy might work, but we cannot exclude the possibility of repeated failures in forecasting and in lifting core inflation. Such an outcome would undermine the credibility of the ECB and would necessitate a discussion on either the deployment of new tools to influence core inflation, or a possible revision of the ECB's inflation goal.



Table 2: Macroprudential policy measures in European countries, mid-2018

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A		C	C -
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