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Decoupling euro area and US yield curves

Benoit MOJON
Director, Monetary
and Financial Studies

Fulvio PEGORARO
Monetary and Financial Studies
Directorate

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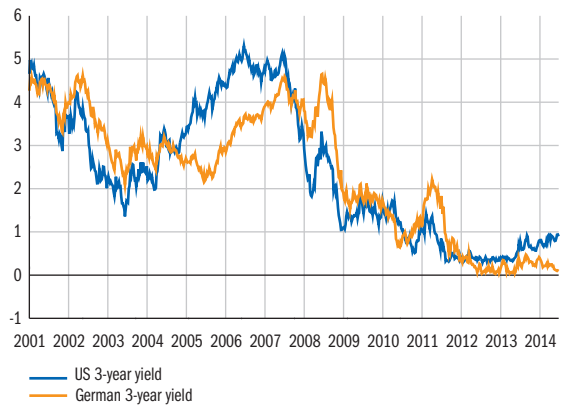
The levels and amplitudes of fluctuations of longer-term US and euro area interest rates have been quite similar since 2001, with an exception from 2005 to 2007 when euro area rates were lower. We show that interest rate differentials between the United States and the euro area usually reflect differences in inflation and GDP forecasts. Given that the cyclical gap between the United States and the euro area is rising back to the levels observed in 2004 and 2005, a decoupling between US and euro area interest rates could be sizeable and persistent.

The euro area and the United States have been and are currently going through a phase of low inflation. This is so in spite of having kept short-term interest rates at historically very low levels since the spring of 2009. Both the Federal Reserve (Fed) and the European Central Bank (ECB) have also turned to forward guidance whereby they commit to keep policy rates (i.e. very short-term rates) at very low levels, for an extended period of time. The Fed announced in August 2011 that it would not raise the fed funds target range (0 to 0.25 percent) before 2013. In 2012, this commitment became dependent on the path of unemployment and inflation. In December 2013, the Fed clarified that it would not raise official rates before projected inflation moved closer to the 2% longer-run goal. Meanwhile, in July 2013, the ECB announced that it would keep its main policy rate at 0.5% or below for an extended period of time. In line with this announcement, the ECB decreased its rate to 0.25% in November 2013, 0.15% in June 2014 and 0.05% in September 2014. In addition, it announced that banks will be offered central bank liquidity for a maturity of up to 4 years at 0.15%, just 10 basis points above the interest rate on its main refinancing operations.

The credibility of these commitments has translated into very low interest rates at longer maturities. As current monetary policy is more likely to influence significantly interest rates expectations only up to a few years, we illustrate this point with 3-year interest rates. Results are very similar for maturities of 2 to 5 years.

Chart 1 compares interest rates at this maturity for the United States and the euro area since 2001. For the euro area, we display the interest rate on German bunds, which remain the most liquid safe asset denominated in euro.

C1 US and German 3-year yields
(interest rates in %, annual basis)



The 3-year nominal interest rates are quite similar in terms of level and amplitude of their fluctuations. They also show cycles that tend to coincide: declining from 2001 to 2003, then rising until 2008, declining from 2008 to 2011 and remaining flat at a very low level since then. By historical standards, these rates have been very low since the Lehman crisis in September 2008 and extremely low since the summer of 2011. However, the two interest rates *may also diverge* as was the case in 2004 and 2005. This divergence led to a positive spread between US and German interest rates until late 2007. We currently observe another episode of divergence since December 2013. The US yield rose from 0.6% to 0.96%, while the German one declined from 0.3% to -0.02%.

In this letter, we analyse the level of 3-year interest rates in the United States and the euro area from two angles: (i) What is the impact of forward guidance? (ii) Given that the cyclical gap between the United States and the euro area is rising back to the levels observed in 2004 and 2005, could US and euro area interest rates decouple again?

In order to answer these two questions, we first use a recent multi-country model of yield curves developed by Pegoraro, Siegel and Tiozzo Pezzoli (2014). This model (see box) describes the joint dynamics of US, UK, German and Japanese yield curves. It features one factor common to all countries and three local factors (level, slope and curvature) for each economy. This model performs better than single country models of the yield curve, especially in forecasting future short-term interest rates up to three years.

How does forward guidance impact the yield curve?

Nominal interest rates can be decomposed into the expectation of the future sequence of short-term interest rates (the expectation term) and a term premium component, which reflects the uncertainty on future short-term interest rates and the risk aversion of investors.

Forward guidance by central banks, which consists in committing to keep future policy rates at a low level, can therefore affect both the expectation term and the term premium. In the extreme case where the central bank sets its short-term interest rate at a constant level for N years, the yield curve should be equal to this constant level up to a maturity of N years. Expected future short-term rates would be known and the term premia would be nil in the absence of uncertainty. However, in the real world, forward guidance of central banks cannot remove all uncertainty of future short-term interest rates. In particular, monetary policy may be subject to time inconsistency if, as economic conditions improve, the prior commitment to keep low interest rates is reconsidered in order to limit inflation risks. In addition, investors may not (fully) understand what central banks mean by forward guidance, or trust the commitment to keep interest rates very low in the future.

The Multi-Country Term Structure Model (MCTSM)

The MCTSM (Pegoraro, Siegel and Tiozzo Pezzoli, 2014) is a linear gaussian state-space model featuring a combination of common and local VAR-distributed latent factors used to explain the joint dynamics of international Treasury yield curves.

In order to correctly take into account relevant dependence between international bond markets, the MCTSM is estimated with one common factor and three local factors (level, slope and curvature) on US, UK, German and Japanese yield curves, observed weekly from January 1995 to December 2013 and for 3-months, 6-months, 1-year, 3-year, 5-year and 10-year maturities.

An innovative solution to the identification problem allows this model to display three sources of dependence at the same time: i) the impact of the common factor on all yield curves through the common loadings; ii) the lagged impact of any (common or local) factor on any other factor and iii) the instantaneous dependence between local factors.

Thanks to this methodology, we are able to provide reliable forecasts of the 3-month short rate and, thus, to provide the decomposition of the 3-year US and German yields (analysed in this document) into an expectation term and a term premium (see Charts 2 and 3, respectively).

C2 US and German 3-year expectations terms

(interest rates in %, annual basis)

T1 Medium run outlook in the euro area and in the United States

(% pondérés)

		2013	2014	2015	2016	2014-2016
US PCE inflation	(1)	1.10	1.30	1.60	1.80	1.60
Dif. with 2% target	(2)	-0.90	-0.70	-0.40	-0.20	-0.40
US GDP growth	(3)	1.90	2.40	3.00	3.00	2.80
Dif. with 2.5% potential	(4)	-0.60	-0.10	0.50	0.50	0.30
Impact on a Taylor benchmark	(5) = 1.5 (2) + 0.5 (4)	-1.65	-1.10	-0.35	-0.05	-0.50
euro area HICP inflation	(6)	1.40	0.70	1.10	1.40	1.10
Dif. with 1.9% target	(7)	-0.50	-1.20	-0.80	-0.50	-0.80
euro area GDP growth	(8)	-0.40	1.00	1.70	1.80	1.50
Dif. with 1.5% potential	(9)	-1.90	-0.50	0.20	0.30	0.00
Impact on a Taylor benchmark	(10) = 1.5 (7) + 0.5 (9)	-1.70	-2.05	-1.10	-0.60	-1.30
Taylor benchmark gap	**(5) – (10)**	**0.05**	**0.95**	**0.75**	**0.55**	**0.80**

Source: ECB, June 2014, Broad Macroeconomic Projection Exercise and authors calculations.

C3 US and German 3-year term premia

(interest rates in %, annual basis)

Chart 2 shows the estimated expectation terms and Chart 3 the term premia that we obtained from the multi-country model mentioned above. Both are presented on the same scale used for the interest rates reported in Chart 1. The 3-year interest rates seem to have been mainly driven by the expectation terms, which reached a first trough in 2003, increased until the eve of the crisis, stayed low since 2009 and then started rising since December 2013. The term premia components fluctuated on a smaller scale and were somewhat counter-cyclical. It is also striking that the two components are again very much correlated across the Atlantic most of the time, except around 2004-2005. During these two years, the decoupling of the two rates seems to have been mainly driven by a larger increase of the US expectation term. In 2013, each component of interest rates evolved in parallel in the United States and in Germany: the expectation terms were very flat around 1% and the estimated term premia were negative[1] around -0.5% until mid-2013, and remained very low until the end of 2013. Hence both the expected terms and the term premia have responded to monetary policy: because short-term rates were not expected to increase, there was little uncertainty and, consequently, low term premia. Nevertheless, from January to June 2014, while the expectation terms have risen in parallel, the German term premium has declined more than that of the US, and this difference drives what seems to be a new decoupling between the two bond markets.

Another episode of business cycle decoupling?

Turning to the current economic outlook, the recovery of the US economy is more advanced and perceived as more solid than in the euro area (Table 1). The average forecasted GDP growth from 2014 to 2016 is 2.8% in the United States and 1.5% in the euro area. Furthermore, current inflation forecasts for 2014-2016 are 1.6% in the US and only 1.1% in the euro area.

What does this imply for interest rates? In normal times, investors would expect unambiguously lower nominal short-term interest rate in the euro area than in the United States. However, at the current juncture, the Fed decided that the interest rate on federal funds should stay at its current level, near zero, well into 2015.

1 *This is likely due to investors' search for yields at a time when traditional money market instruments offer extremely low interest rates.*

A rough calculation, inspired by the original Taylor rule,[2] helps to get a sense of how much short-term interest rates could differ across the Atlantic. The Taylor rule is a benchmark for the level of short-term interest rates according to which the nominal policy rate should respond to deviations of inflation from its target and to the gap between economic activity and its "potential", defined as the level where there are neither inflationary nor deflationary pressures. According to the original Taylor "rule of thumb", we build an "interest rate benchmark" using the ECBs' forecasts for inflation and GDP growth for both areas. We simply add:

- 1.5 times the gap between inflation and its medium to longer-run goal, which we set at 1,9% for HICP inflation in the euro area and at 2% for the consumption deflator in the United States; and

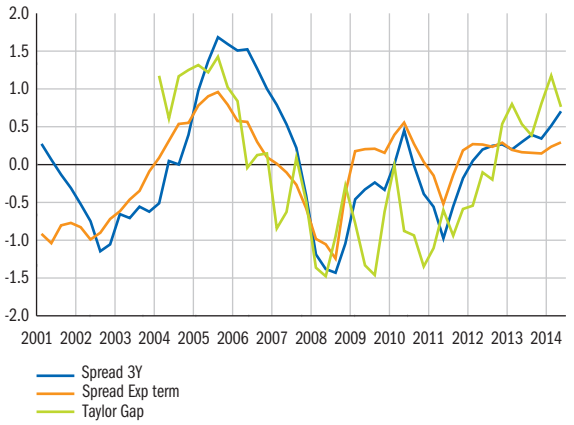
- 0.5 time the gap between annual GDP growth and its potential growth, which we assume to be 1.5% for the euro area and 2.5% for the United States.

The impact of economic conditions on this Taylor benchmark is reported in Table 1 from 2013 to 2016 using the ECB June 2014 broad macroeconomic projection exercise. We obtain a very similar interest rate benchmark in 2013. However, the benchmark remains much more negative in the euro area than in the United States in 2014, 2015 and 2016. The gap between the US and euro area Taylor benchmark interest rates amount to 0.95 in 2014, 0.75 in 2015 and 0.55 in 2016. The average differential over the 3 years, of around 0.80%, roughly corresponds to the differential of 3-year interest rates for the end of June 2014 (the last observation in Chart 1). In other words, the interest rate differential at the 3-year maturity can be explained by investor's expectation that the Fed and the ECB interest rates should be responding to the expected economic and inflation conditions up until 2016.

We now compare in Chart 4 the interest rate differentials with Taylor rule gaps constructed using quarterly vintages of ECB staff forecasts from 2004 till June 2014.

C4 Spreads between the US and EA interest rates

(interest rates in %, annual basis)



For each vintage, the Taylor gap is constructed exactly as in the last column of Table 1, using the average of forecast path of GDP growth and inflation. It should be noted that these projections, which do not reflect the views of the ECB Governing Council, tend to be similar to other available forecasts and they can be taken as a fair approximation of the consensus view by economists and investors.

We compare the Taylor benchmark gap to the spread between the 3-year interest rates that were shown in Chart 1 and the spreads between the expectation terms that were reported in Chart 3. The fluctuations in the US-euro area interest rate spreads largely reflect the spread of their expectation terms and the expected Taylor gap. Looking forward, a widening cyclical gap across the Atlantic would likely lead to a decoupling of US and euro area interest rates, at least on the medium term maturity of the yield curve.

References

Pegoraro (F.), Siegel (A. F.) and Tiozzo Pezzoli (L.) (2013)
"Specification Analysis of International Treasury Yield Curve Factors", Banque de France, working paper No. 490, June.
Download the paper

Taylor (J. B.) (1993)
"Discretion versus Policy Rules in Practice", Canergie-Rochester Conference Series on Public Policy, 39, pp. 195-214.

2 *Taylor (1993) proposed to describe the U.S. monetary policy by an interest rate feed-back rule of the form*

$$i_t = \bar{i}_t + 1.5\,(\pi_t - \bar{\pi}_t) + 0.5\,(y_t - \bar{y}_t)$$

where $\bar{i}_t$ is the baseline nominal interest rate path, $\bar{\pi}_t$ denotes the inflation target, while $\bar{y}_t$ indicates the potential GDP growth. Given the uncertainty on the level of potential output, it is frequent to replace the second term by the difference between the growth rate of output and potential output growth. The rule is then

$$i_t = \bar{i}_t + 1.5\,(\pi_t - \bar{\pi}_t) + 0.5\,(x_t - \bar{x}_t)$$

where x is the growth rate of GDP. In our derivations, we abstract altogether from the intercept and potential cross-country differences between intercepts.

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