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WEEKLY ECONOMIC INSIGHTS

A PUBLICATION OF THE **ECONOMIC RESEARCH** TEAM

HIGHLIGHTS OF THE WEEK

Economist insights: In the US, the Federal Reserve said it is "listening" to markets; activity has slowed again in the eurozone (p.2)

- **United States**
  - The Federal Reserve indicated it could be patient, which reassured investors

- **Eurozone**
  - Drop in economic sentiment in the eurozone
  - Negative outlook for French consumption and German industry

Focus Structural Analysis: Is an inversion of the yield curve an early indicator of recession? (p.6)

- The estimates of our econometric model indicate that the flattening of the yield curve does enable us to predict a near-term recession for the US, the UK and Germany
- Based on these estimates, the probability of entering a recession in the next 12 months works out at 8.7% for the US, 3.5% for the UK, and 0.0% for Germany
- However, the constraint of the 'effective lower bounds' of the key rates, and the implementation of QE could result in a bias in the estimation of the probability of recession
- According to our analysis, this distortion is limited in the US and relatively limited in the UK, while we deem it to be substantial for Germany

ECONOMIST INSIGHTS

1. **United States**
   The Federal Reserve has confirmed it will proceed with caution, which reassured investors

2. **Eurozone**
   Decline in consumer confidence in France and in German industrial production

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1. UNITED STATES: THE FEDERAL RESERVE BACK TO BEING "MARKET DEPENDENT"

As we were expecting, the US central bank (the Federal Reserve, or Fed) raised its key rate, the fed funds rate, by 25 basis points to 2.50% following its meeting on 19 December 2018.

While the statement and the new forecasts of the members of the monetary policy committee (FOMC) contained some accommodative elements, the Fed's communication was generally taken to be hawkish, due firstly to the FOMC's anticipation of three key rate hikes by the end of 2020, and also because Fed Chairman Jerome Powell, during his press conference, appeared to close the door to any imminent interruption in the reduction of the size of the central bank's balance sheet.

Since the beginning of 2019, several FOMC members, notably Jerome Powell, and the minutes of the December meeting, have attempted to clarify this communication. By emphasising the Fed's ability to adopt, if necessary, a cautious approach, by reiterating that its monetary policy was "not on a preset course", but dependent on both the economic and financial environment, officials were able to reassure investors.

Following its meeting of 19 December, the Fed raised its fed funds rate by 25 basis points to 2.50%, its ninth hike in its key rate since December 2015, bringing the total extent of the monetary tightening to 225 basis points.

Both the statement published following the decision and the new forecasts of the FOMC members suggested that the Fed intends to proceed with caution. The press release indicated that the FOMC members considered that only "some" additional rate increases should be made in the future. Furthermore, it stated that while the Fed continued to believe that the risks to the economic outlook are "balanced", the FOMC "*will continue to monitor global economic and financial developments and assess their implications for the economic outlook*". This indication, similar to the words used by the Fed in its statement at the beginning of 2016, was, according to our analysis, a clear signal of the Fed's cautious attitude in a context of a significant increase in volatility on financial markets.

However, the Fed's communication was overall considered to be slightly hawkish, and for two main reasons, according to our analysis:

- Firstly, although the median projection of the FOMC members for the fed funds rate in 2019 was revised down slightly vs. the September projection (see table below), the FOMC members anticipate that the fed funds rate could increase to 3.25% between now and the end of 2020, i.e. almost 50 basis points higher than the long-term rate, which they anticipate at 2.8%.
- Secondly, during his press conference, Jerome Powell stated that the balance sheet reduction was on "automatic pilot", adding that if the Fed had to adjust its monetary policy to changes in the economic context, it would only use its fed funds rate to do so. Chairman Powell thus seemed to close the door to any imminent interruption in the reduction of the Fed's balance sheet.

The concerns expressed by investors following this meeting led several FOMC members, since the beginning of 2019, to clarify their message in order to affirm the Fed's intentions to be flexible and ability to be patient.

This was notably the case of Charles Evans, James Bullard, and Eric Rosengren, but, especially, Powell too, who on two occasions, on 4 and 9 January, gave dovish messages, in an attempt to come back on parts of his December press conference which may have been wrongly interpreted.
The Fed Chairman thus notably emphasised that the Fed's monetary policy would remain "flexible" and that the Fed is prepared to shift its monetary policy stance "significantly if necessary". He added that this flexibility applies to both the fed funds rate and the run-off of the balance sheet, thus demonstrating that the Fed was not closed to the idea of interrupting the reduction of its balance sheet, in the event of an additional tightening of financial conditions. Lastly, while Jerome Powell reiterated that the economic outlook remained favourable according to the Fed, he added that the central bank is "listening carefully" to markets. According to Powell, the Fed has room for manoeuvre to adopt a cautious stance given the weak inflationary pressure.

The minutes of the December meeting, also published on 9 January, echoed this analysis. They notably mention the contrast between the robustness of economic activity and the worries expressed by the financial markets, which, according to the FOMC, reflect the uncertainty about the outlook for global growth. The minutes also specified that the weak inflationary pressure allows the Fed to be patient, that the monetary policy is not on a "preset course" and that it would be guided by incoming data (data dependent).

Implications

- As we were expecting, the Fed raised its key rate to 2.50% at its December 2018 meeting.
- While the Fed's tone at this meeting was generally deemed to be hawkish, recent comments by several FOMC members, and notably J. Powell, reassured investors. Thus, for example, the VIX volatility index of the S&P 500 equity index, which had reached 36.0 on 24 December, its highest level of the year following the peak of 37.0 it had hit in February 2018, has dropped by 16 points since, notably following the comments made by Jerome Powell on 4 and 9 January.
- According to our analysis, both the Fed's press release, which used similar wording as that used at the beginning of 2016, and the recent comments made by the FOMC members show that the Fed has reintroduced a "market dependent" factor in setting its monetary policy. It stated that it would be cautious and take account of the rise in financial market volatility despite the outlook for the US economy remaining robust, according to our analysis.
- This 'market dependent' nature of the US monetary policy is a very important element for our scenario and forecasts, as it confirms that, if the stimulus plan implemented by the Chinese authorities is unable to produce the acceleration in GDP growth in H1 2019 that we expect, the Fed could decide to make a pause in its monetary tightening cycle.
- Because we expect a slight acceleration in growth in Chinese GDP in H1, which should contribute to reducing the volatility on financial markets, we maintain our forecast according to which the fed funds rate could be raised to 3.25% by the end of 2019.

FOMC median projections December 2018	2018	2019	2020	2021	Long terme
Change in real GDP	**3.0**	**2.3**	**2.0**	**1.8**	**1.9**
September projections	*3.1*	*2.5*	*2.0*	*1.8*	*1.8*
Unemployment rate	**3.7**	**3.5**	**3.6**	**3.8**	**4.4**
September projections	*3.7*	*3.5*	*3.5*	*3.7*	*4.5*
PCE Inflation	**1.9**	**1.9**	**2.1**	**2.1**	**2.0**
September projections	*2.1*	*2.0*	*2.1*	*2.1*	*2.0*
Core PCE inflation	**1.9**	**2.0**	**2.0**	**2.0**	
September projections	*2.0*	*2.1*	*2.1*	*2.1*	

Source: US Federal Reserve, Edmond de Rothschild

FOMC median projections December 2018	2018	2019	2020	2021	Long terme
Fed funds rate	**2.4**	**2.9**	**3.1**	**3.1**	**2.8**
September projections	*2.4*	*3.1*	*3.4*	*3.4*	*3.0*

2. EUROZONE: DECLINE IN CONSUMER CONFIDENCE IN FRANCE AND IN GERMAN INDUSTRIAL PRODUCTION

The European Commission's economic sentiment indicator for the eurozone for December 2018 decreased by 2.2 points from 109.5 to 107.3. While these levels remain high, this was nevertheless the twelfth month of decline in a row. This weakening concerned the main sectors:

- The industrial sector lost 2.3 points: firms were more pessimistic concerning future production, the current level of order books and the stocks of finished products.
- The consumer confidence indicator also deteriorated by 2.3 points, as consumers have lower expectations for the economic situation, unemployment, their future financial situation and savings capacity.
- The services sector lost 1.4 point due to a deterioration in the sub-components of past business situation, and past and expected demand.
- The construction sector lost 1 point following the deterioration in employment expectations, despite a slight improvement in order books.

These indices weakened for the four largest European economies, i.e. Spain (-3.0 points), France (-2.0 points), Germany (-1.9 point) and Italy (-1.4 point).

The consumer confidence indicator in France corroborated the deterioration in the indicators provided by the European Commission (see Chart 1). The INSEE index thus dropped from 91 to 87 (-4 points) due to the decrease in the sub-components related to major purchases (-15 points, a five-year low), savings opportunities (-9 points), expected savings capacity (-7 points), current financial situation (-5 points), current savings capacity (-5 points), and future financial situation (-3 points). Lastly, expectations of the future standard of living are stable, but at a three-year low. These trends confirm, according to our forecasts, moderate growth in French private consumption at 1.3% in 2019 and 1.2% in 2020.

According to our analysis, the lack of economic growth in France would not be offset by the level of growth in German activity, which should decline, and which would lead to a further marked deceleration in the economic growth of the eurozone. These prospects are underpinned by recent PMI lead economic indicators (down from 51.3 to 51.1 in December 2018), and in particular by the trend in German industrial production.

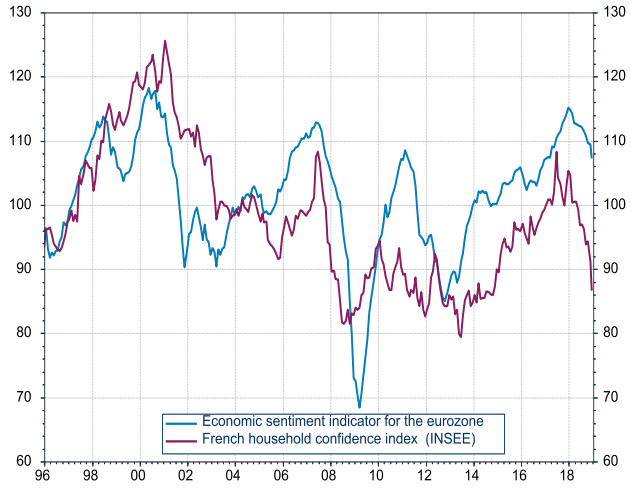
Growth in German industrial orders was down in November 2018, from -3.0% to -4.3% year-on-year (see Chart 2), confirming the decline observed in industrial production over this period, of 4.7% y-o-y and 1.9% over the month. Two sectors were behind the drop in industrial production: (1) the auto sector, which has not fully adapted to the new WLTP standards introduced in September – production could pick up again in Q1 2019, and (2) the pharmaceuticals sector, which underwent a downward correction following the strong rise observed over several months in the middle of 2018. The trend in industrial production confirms the contraction in the order books observed over the past few months, while production capacity utilisation rates remain above their long-term average levels.

Implications

- The most recent economic data and confidence surveys for the eurozone underpin our scenario of a further slowdown in GDP growth in 2019.

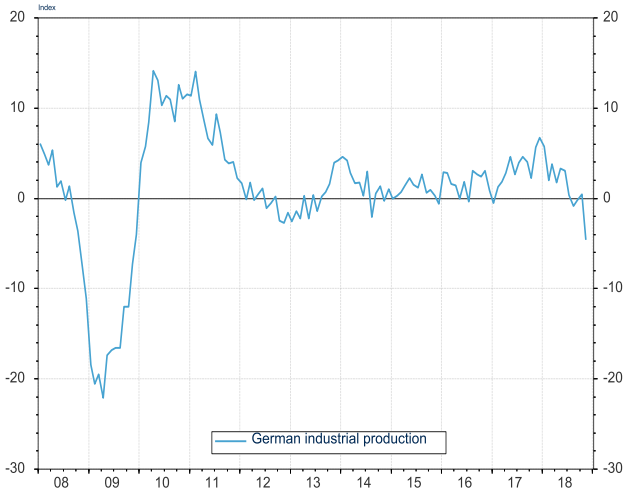
- We maintain our scenario according to which GDP growth would decelerate in 2019 from 1.6% to 1.3% in France, from 1.7% to 1.6% in Germany and from 1.8% to 1.5% for the eurozone.

Chart 1: Economic sentiment continues to contract, notably that of French consumers



Source: Thomson Reuters Datastream / Edmond de Rothschild Economic Research

Chart 2: German industrial production contracted by 4.3% year-on-year



Source: Thomson Reuters Datastream / Edmond de Rothschild

FOCUS STRUCTURAL ANALYSIS

IS AN INVERSION OF THE YIELD CURVE AN EARLY INDICATOR OF RECESSION?

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We have developed an econometric model in order to determine to what extent a flattening or inversion of the yield curve is an early indicator of recession.

- *Our results indicate that the flattening of the yield curve does enable us to predict a near-term recession for the US, the UK and Germany.*
- *According to our model, in December 2018, the probability of a transition into recession in the next 12 months is 8.7% for the US, 3.5% for the UK, and 0.0% for Germany.*
- *However, the constraint of the 'effective lower bounds' of the key rates, and unconventional monetary policies (quantitative easing) could lead to a bias in the estimation. According to our analysis, this distortion is limited in the US and the UK, while we deem it to be substantial for Germany.*

The significant flattening of the yield curve observed in the US in 2018 was considered by some to be a sign that the US economy could enter into recession in 2019. The argument used to justify the fear of a recession in the US is that a large number of episodes of recession since WWII had been preceded by an inversion of the yield curve.

However, some academic and central bank observers have noted that the relationship between the yield curve and recession may have changed since the financial crisis of 2008. We have developed our own econometric model by integrating these new elements in order to answer the following questions:

- What is the probability of a recession happening in the US, the UK, Germany or Switzerland?
- What is the quality of the signal of recession used in our model in light of past experience?
- Over what horizon is the predictive power of a recession the greatest (6 to 12 months, or longer term)?
- What yield spread has the strongest quantitative effect on the probability of a recession, the 10-year/2-year or the 2-year/3-month? Is the relationship between the yield spread and the probability of a recession stronger in the case of an inversion of the yield curve?

The conclusions drawn from our model and our analysis are summarised in Table 1 below.

Table 1: Summary of the main results

	What is the quality of the recession signal based on past experience?	**Which yield spreads** are the most relevant? Inclusion of the 3-month rate as an explanatory variable?	**What is the bias** resulting from the constraint of the effective lower bound and QE on the probability of entering recession?	**Estimated probability of entering into recession in the next 12 months**
United States	Excellent and maximal at 12 months	10-year/2-year and 2-year/3-month + 3-month yield	Limited bias	**8.7%** (average: 9.9%; peak of financial crisis: 73.5%)
United Kingdom	Good and maximal at 12 months	10-year/2-year and 2-year/3-month	Relatively limited bias	**3.5%** (average: 5.5%; peak of financial crisis: 21.7%)
Germany	Good and maximal at 6 months	10-year/3-month + 3-month yield	Significant bias	**0.0%** (average: 6.8%; peak of financial crisis: 48.4%)
Switzerland	Poor (maximal at 12 months)	10-year/3-month	Significant bias	**17.3%** (average: 19.0%; peak of financial crisis: 21.2%)
Japan	Very poor	-	Very significant bias	-

Source: Edmond de Rothschild Economic Research

A. Why is a significant flattening or an inversion of the yield curve an early indicator of recession?

To answer this question, we first must look at the relationship between short-term and long-term interest rates. According to financial theory, long-term interest rates can be broken down into the average of future short-term rates expected by the market plus a term premium.

- In general, the term premium is higher for long maturities than for short maturities, hence the positive yield curve.
- It is also possible to find ourselves in a situation in which the flattening of the yield curve is such that it becomes negative, despite the term premium. This is called an inversion of the yield curve. This generally happens at the end of an economic cycle when the market anticipates a monetary easing cycle.

Thus, a significant flattening of the yield curve leading to its inversion reflects a rise in the probability of a future recession estimated by the market, as investors are expecting the central bank to react by making a series of cuts in its key rate.

It is important to understand that the relationship between the yield curve and recession is not one of cause and effect: it is based on investor expectations, and long-term rates being lower than short-term rates are not a factor that triggers recession. On the contrary, an inversion of the yield curve should work as a factor supporting the activity of the majority of businesses, with the exception of the banking sector.

The econometric model we have built is based on this mechanism and follows the recent developments in academic literature (see Appendix 1 for formal details). First, we modelled the probability that an economy will enter into a period of recession by using a *probit* model. Second, we based our work on two articles published in 2006 and 2018 by Fed economists.

- The first article, published by Wright (2006) shows that the inclusion of the level of the key rate as an explanatory variable in the model improves the predictive power of recession (*in-sample* and *out-of-sample*).[1] When our estimates show that this variable is significant with the expected positive sign, we have systematically added it to the model.
- The second article, published recently by Engstrom et Sharpe (2018), shows that the 2-year/3-month spread better reflects market expectations of future actions by the US Federal Reserve (Fed) and that its reduction generates a quantitatively stronger effect on the increase in the probability of a recession.[2]

B. Why has the financial crisis altered the relationship between the yield curve and probability of recession?

Two events could bias the predictive content of a recession linked to the flattening of the yield curve.

The first relates to the fact that central banks such as the US Federal Reserve (Fed), the European Central Bank (ECB), the Bank of England (BoE) and the Swiss National Bank (SNB) have lowered their key rates to levels close to their effective lower bounds since the financial crisis of 2008 (see Chart 1). Moreover, in this case, central banks' room for manoeuvre to opt for additional cuts in their key rates in the event of recession is limited. Thus, the constraint of the effective lower bound leads to an underestimation of the probability of recession. The Fed is currently the only one of these central banks that has eliminated the restriction of the effective lower bound, which results in less distortion of the relationship between the yield curve and recession.

The second event is linked to the first. As following the 2008 financial crisis the above-mentioned central banks exhausted the room for manoeuvre of their conventional monetary policies due to the restriction of the effective lower bound, they then used unconventional monetary policies (quantitative easing, or QE). We can distinguish two types:

- The first type of QE is the programme of large-scale asset purchases. These programmes were implemented by the Fed (2008-2014 with periods of interruption), the BoE (2008-2016, also with phases of interruption), and more recently the ECB (2015-2018). As demonstrated by Christensen and Rudebusch (2011) and Krishnamurthy and Vissing-Jorgensen (2012), these programmes contributed to a compression of the term premium in the US and the UK. [3] We can also expect that the QE launched by the ECB in 2015 has produced similar effects in the eurozone.
- Interventions on foreign exchange markets represent the second type of quantitative easing. The SNB has used this type of intervention, which consisted of buying euros on the forex market in order to reduce the upward pressure on the Swiss franc.[4] The currencies accumulated were then invested in foreign securities. Christensen and Krogstrup (2015) show that the increase in the balance sheet of the SNB that resulted from these interventions also led to a reduction in the term premium in Switzerland.

Although the Fed, the ECB and the BoE have ended their massive asset purchase programmes, these central banks continue to be major actors on the bond markets due to the amount of sovereign securities they hold in their balance sheets. As regards the SNB, despite the end of its massive interventions on the foreign exchange markets from mid-2017, the size of its balance sheet, which corresponds to 117% of Switzerland's GDP in Q3 2018, remains at a record level.

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[1] See Jonathan H. Wright (2006), "The Yield Curve and Predicting Recessions", Finance and Economics Discussion Series 2006-07. Washington: Board of Governors of the Federal Reserve System.
[2] Engstrom, Eric, and Steve Sharpe (2018), "The Near-Term Forward Yield Spread as a Leading Indicator: A Less Distorted Mirror," Finance and Economics Discussion Series 2018-055. Washington: Board of Governors of the Federal Reserve System.
[3] See the following academic articles: Christensen, Jens HE and Rudebusch, Glenn D (2012), "The response of interest rates to US and UK quantitative easing", The Economic Journal 122; Krishnamurthy, Arvind and Vissing-Jorgensen, Annette (2011), "The effects of quantitative easing on interest rates: channels and implications for policy", National Bureau of Economic Research
[4] Despite the strong upwards pressure on the franc that we have observed since May 2018, the SNB's actions were of much smaller proportion than those in the period following the discontinuation of the floor rate, during which it had considered the franc to be "significantly overvalued" (from January 2015 to August 2017). This decision to be less accommodative than in 2015 and 2016 remains consistent with its assessment of the strength of the franc and the risk of deflation.

Thus, according to our analysis, the implementation of QE, which lowered the term premium and the yield spread, has important implications in terms of predictive content of the yield curve for recession. Firstly, the implementation of QE can lead to an overestimation of the probability of recession through the reduction in the term premium. For example, Chart 2 shows that the term premium in the US has been reduced considerably since 2011. Secondly, it can change the direction of the link between the yield spread and the probability of recession. In a situation of conventional monetary policy, a drop in the key rate would, all things being equal, lead to a rise in the yield spread (steepening of the yield curve) and a reduction in the risk of a recession. We thus obtain a negative relationship between these two variables. Conversely, with unconventional monetary policy, the central bank implements a monetary stimulus plan in order to lower the long-term rate. The quantitative easing will have the effect of flattening the yield curve and lowering the probability of recession, hence the positive relationship between the yield curve and the probability of recession. According to our analysis, when there is the constraint of an effective lower bound, episodes of flattening of the yield curve are more the result of QE than of expectations of future short-term rates.

C. What conclusions can be drawn from the estimates of our econometric model?

We have estimated our econometric model by using monthly data (see insert for more details) over the period 1985-2009.

The results of the estimates of our econometric model enable us to draw four main conclusions.

1st conclusion: the predictive power of the flattening of the rate curve is maximal for a near-term recession (i.e. which would happen in the next 6 months in Germany and in the next 12 months in the US, the UK and Switzerland). The quality of the signal of a near-term recession is excellent for the US, good for the UK and Germany, and can be labelled poor for Switzerland.

2nd conclusion: for the US and the UK, we have modified our model by breaking down the 10-year/3-month yield spread into a short-term spread represented by the 2-year/3-month differential and a long-term spread represented by the 10-year/2-year differential.

3rd conclusion: in the event of an inversion of the yield curve, the probability of a recession does not rise significantly more than what is predicted by the reduction in the yield spread.

4th conclusion: using the estimates of our econometric model and the date of the yield curve of December 2018, we obtain a probability of a recession in the next 12 months of 8.7% for the US, 3.5% for the UK, 0.0% for Germany and 17.3% for Switzerland.

Chart 1: The effective lower bound and implementation of QE bias the relationship between the yield curve and recession

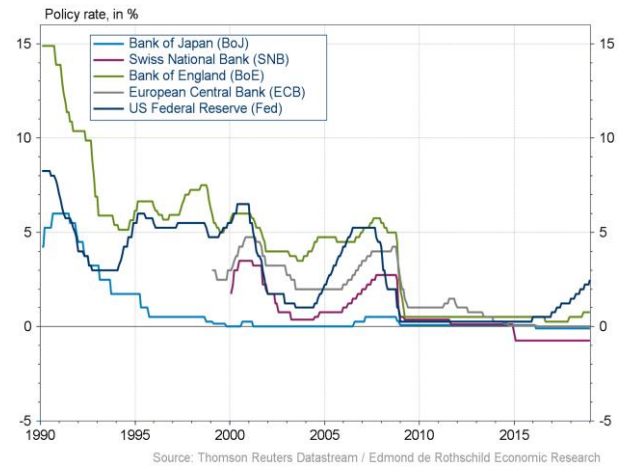


Chart 2: The term premium in the US has decreased considerably since 2011

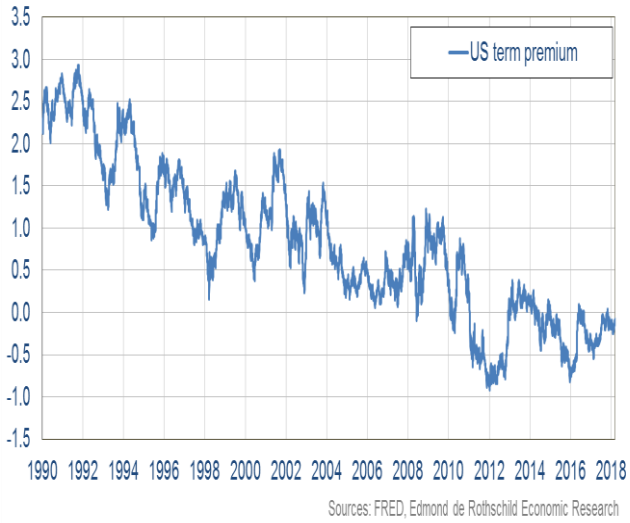


Chart 3: The predictive power of a near-term recession is good, even very good depending on the country...

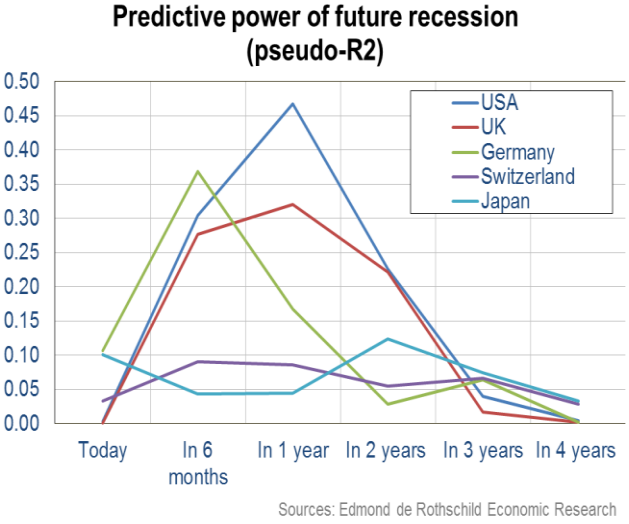


Chart 4: ... while including short-term rates improves the results, especially in Germany

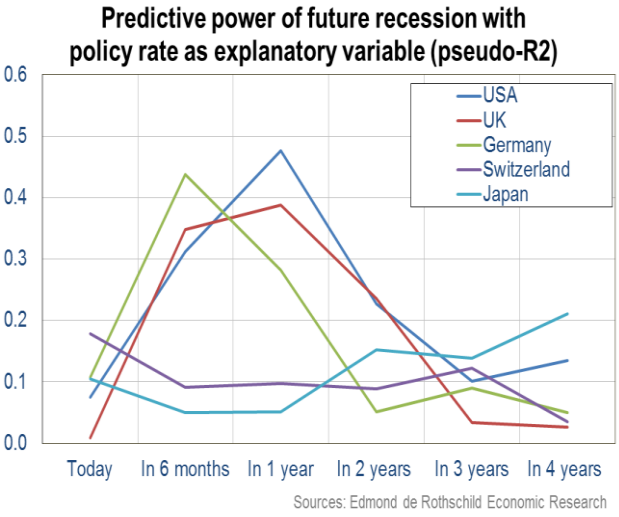


Chart 5: Our estimate of the probability of a recession at end-2019 is 8.7% for the US...

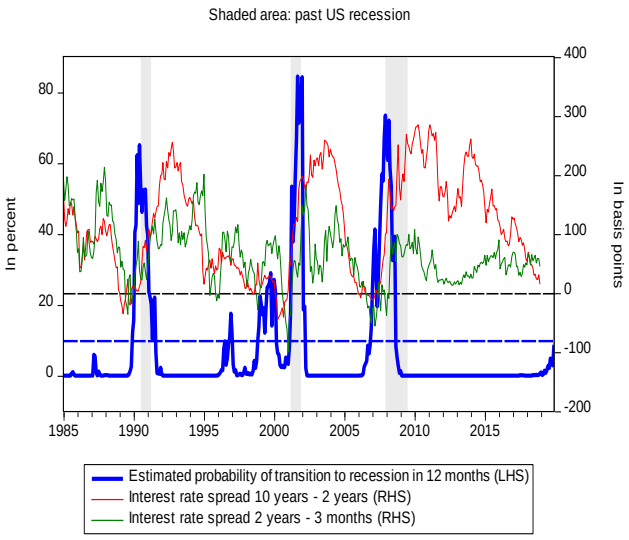


Chart 6: ... 3.5% in the UK...

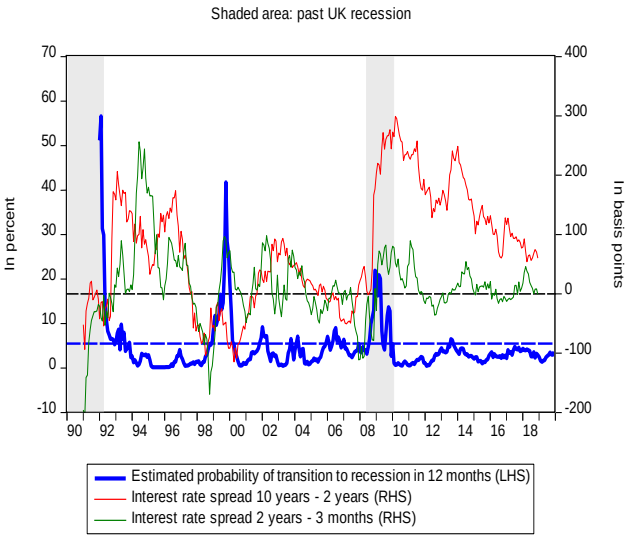


Chart 7: … 17.3% in Switzerland

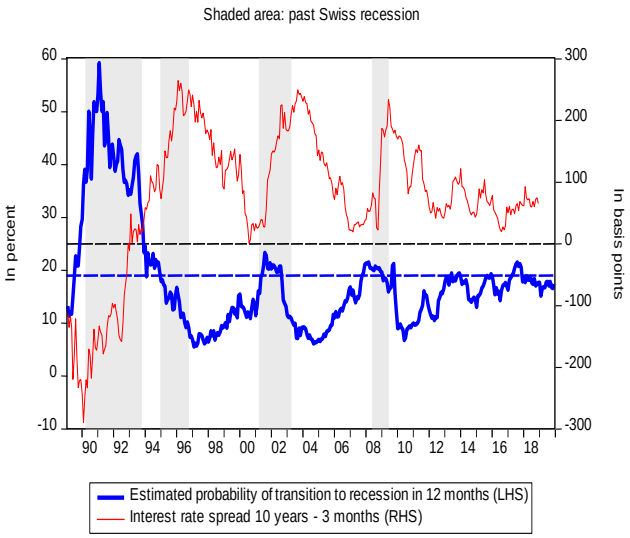
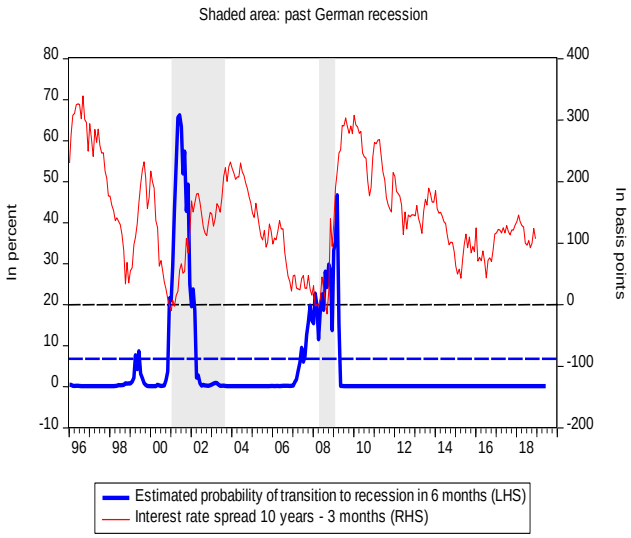


Chart 8: Our model estimates zero probability of recession in Germany in mid-2019



APPENDIX 1 – ECONOMETRIC MODEL AND ESTIMATION

Our basic econometric model follows the academic literature and takes the following form:

$$Probability\left(Recession_{c,t+h} = 1\right) = \phi\left(c + \beta \times Spread_{c,t}^{10y-3m}\right)$$

where $\phi(.)$ represents the cumulative distribution function from the standard normal distribution. $Probability\left(Recession_{c,t+h} = 1\right)$ refers to the probability that country c will enter recession in the next few months, $Spread_{c,t}^{10y-3m}$ is the difference in month t between the long-term rate (10 years) and the short-term rate (3 months). We then modified the basic econometric model following the work of Engstrom and Sharpe (2018) and Wright (2006) (see footnotes 1 and 2):

$$Probability\left(Recession_{c,t+h} = 1\right) = \phi\left(c + \beta \times Spread_{c,t}^{10y-3m} + \gamma \times Rate_{c,t}^{3m}\right)$$

$$Probability\left(Recession_{c,t+h} = 1\right) = \phi\left(c + \beta_0 \times Spread_{c,t}^{10y-2y} + \beta_1 \times Spread_{c,t}^{2y-3m} + \gamma \times Rate_{c,t}^{3m}\right)$$

where $Rate_{c,t}^{3m}$ is the 3-month interest rate in month t, $Spread_{c,t}^{10y-2y}$ et $Spread_{c,t}^{2y-3m}$ are the 10-year/2-year spread and the 2-year/3-month spread respectively. We estimated the different versions of our econometric model in Eviews using the Non-linear least squares (NLLS) method. The estimation period ends in 2009 for all countries but due to data limitations begins in 1985 for the United States, 1990 for the United Kingdom and Switzerland, 1996 for Germany and 1995 for Japan. The results tables are available on request.

APPENDIX 2 – LATEST CHANGES ON FINANCIAL MARKETS

PERFORMANCE IN LOCAL CURRENCY 11.01.2019	LAST PRICE	WEEKLY CHANGE	MONTHLY CHANGE	YEAR-TO-DATE CHANGE	1-YEAR CHANGE
Equities					
World (MSCI)	1'957	2.8%	0.8%	3.9%	-10.4%
United States (S&P 500)	2'596	2.5%	-0.1%	3.6%	-6.8%
Eurozone (Euro Stoxx 50)	3'070	0.9%	-0.7%	2.3%	-15.0%
Germany (DAX)	10'887	1.1%	0.2%	3.1%	-17.8%
France (CAC 40)	4'781	0.9%	-1.5%	1.1%	-13.3%
Spain (IBEX 35)	8'877	1.6%	-0.1%	3.9%	-15.2%
Italy (FTSE MIB)	19'290	2.4%	2.0%	5.3%	-17.7%
Portugal (PSI 20)	4'959	1.6%	3.2%	4.8%	-11.8%
United Kingdom (FTSE 100)	6'918	1.2%	1.1%	2.8%	-11.1%
Switzerland (SMI)	8'828	2.6%	1.3%	4.7%	-7.5%
Japan (Nikkei)	20'360	4.1%	-4.7%	1.7%	-13.9%
Emerging Markets (MSCI)	1'001	3.8%	3.0%	3.7%	-17.1%
Sovereign Bonds, 10Y *(change in basis point)*					
United States	2.70%	1.2	-18.9	1.6	15.5
Eurozone					
Germany	0.24%	15.3	-1.3	-0.3	-34.2
France	0.66%	-5.1	-4.8	-4.6	-18.8
Spain	1.45%	-2.0	3.3	2.9	-5.6
Italy	2.85%	-1.6	-8.5	11.2	87.1
Portugal	1.71%	-5.7	4.1	-1.7	-8.9
United Kingdom	1.29%	1.1	5.0	1.3	-4.9
Switzerland	-0.15%	17.2	1.2	9.8	-16.1
Japan	0.02%	144.7	-1.8	1.4	-6.1
Emerging Markets (local currency)	4.93%	2.0	-17.0	9.4	10.5
Corporate Bonds *(change in basis point)*					
United States (IG Corp.)	4.17%	-3.9	-15.8	85.8	84.3
Eurozone (IG Corp.)	1.36%	-0.1	0.0	64.0	59.4
Emerging Markets (USD)	6.17%	-25.7	-38.9	166.4	170.0
High-Yield Bonds *(change in basis point)*					
United States (HY Corp.)	7.20%	-46.9	-14.8	148.9	159.5
Eurozone (HY Corp.)	4.80%	-34.0	-22.9	190.0	188.6
Convertible Bonds					
United States (Convert. Barclays)	49	3.8%	-2.5%	4.4%	-6.4%
Eurozone (Convert. Exane)	7'426	0.8%	0.1%	1.0%	-4.8%
Commodities					
Commodities	403	1.3%	-0.3%	3.0%	-5.0%
Gold	1'290	0.3%	4.2%	0.6%	-3.4%
Crude Oil (Brent)	60	5.7%	0.8%	12.5%	-14.6%
Currencies					
Dollar Index	95.6	-0.1%	-1.9%	-0.6%	5.1%
EURUSD	1.15	0.0%	1.5%	0.0%	-6.5%
GBPUSD	1.28	0.4%	2.0%	0.6%	-7.0%
USDCHF	1.02	0.3%	-1.6%	0.1%	2.0%
USDJPY	108.1	-0.5%	-4.6%	-1.4%	-2.2%

Source : Bloomberg

APPENDIX 3 – MAIN ECONOMIC INDICATORS

Main Economic Indicators - Released (7 January - 11 January) and to be released (14 January - 18 January)

US

Date	Indicator	Period	Consensus	Actual	Prior	Revised
07/01	**ISM Non-Manufacturing, month**	**Dec**	**58.5**	**57.6**	**60.7**	**--**
09/01	**FOMC Meeting Minutes**	**Dec 19**	**--**	**--**	**--**	**--**
11/01	**CPI, YoY**	**Dec**	**1.9%**	**1.9%**	**2.2%**	**--**
11/01	**Core CPI, YoY**	**Dec**	**2.2%**	**2.2%**	**2.2%**	**--**
15/01	*PPI, YoY*	*Dec*	*2.5%*	*--*	*2.5%*	*--*
15/01	*Core IPP, GA*	*Dec*	*2.9%*	*--*	*2.7%*	*--*
15/01	*Advance Goods Trade Balance, month*	*Nov*	*-$76.1b*	*--*	*-$77.2b*	*-$77.0b*
15/01	*New Home Sales, month*	*Nov*	*567k*	*--*	*544k*	*--*
15/01	*Durable Goods Orders, MoM*	*Nov F*	*0.8%*	*--*	*0.8%*	*--*
15/01	*Trade Balance USD, month*	*Nov*	*-$54.0b*	*--*	*-$55.5b*	*--*
16/01	*Retail Sales Inc. Auto Fuel, MoM*	*Dec*	*0.1%*	*--*	*0.2%*	*--*
16/01	*Retail Sales, Control Group, MoM*	*Dec*	*0.4%*	*--*	*0.9%*	*--*
17/01	*Building Permits, month*	*Dec*	*1290k*	*--*	*1328k*	*--*
17/01	*Housing Starts, month*	*Dec*	*1253k*	*--*	*1256k*	*--*
18/01	*Industrial production, MoM*	*Dec*	*0.2%*	*--*	*0.6%*	*--*
18/01	*Manufacturing Production, MoM*	*Dec*	*0.3%*	*--*	*0.0%*	*--*

Eurozone

Date	Indicator	Period	Consensus	Actual	Prior	Revised
07/01	**Retail Sales Inc. Auto Fuel, MoM**	**Nov**	**0.2%**	**0.6%**	**0.3%**	**0.6%**
08/01	**Economic Confidence, month**	**Dec**	**108.2**	**107.3**	**109.5**	**--**
08/01	**Business Climate Indicator, month**	**Dec**	**1.0**	**0.8**	**1.1**	**1.0**
09/01	**Unemployment Rate, month**	**Nov**	**8.1%**	**7.9%**	**8.1%**	**8.0%**
14/01	*Industrial production, MoM*	*Nov*	*-1.5%*	*--*	*0.2%*	*--*
17/01	*Core HICP, YoY*	*Dec F*	*1.0%*	*--*	*1.0%*	*--*
17/01	*HICP, YoY*	*Dec F*	*1.6%*	*--*	*1.9%*	*1.9%*

Germany

Date	Indicator	Period	Consensus	Actual	Prior	Revised
07/01	**Factory Orders, MoM**	**Nov**	**-0.1%**	**-1.0%**	**0.3%**	**0.2%**
08/01	**Industrial production, MoM**	**Nov**	**0.3%**	**-1.9%**	**-0.5%**	**-0.8%**
16/01	*HICP, YoY*	*Dec F*	*1.7%*	*--*	*1.7%*	*--*

France

Date	Indicator	Period	Consensus	Actual	Prior	Revised
10/01	**Manufacturing Production, MoM**	**Nov**	**0.4%**	**-1.4%**	**1.4%**	**--**
15/01	*HICP, YoY*	*Dec F*	*1.9%*	*--*	*1.9%*	*--*

Switzerland

Date	Indicator	Period	Consensus	Actual	Prior	Revised
08/01	**Unemployment Rate, month**	**Dec**	**2.4%**	**2.4%**	**2.4%**	**--**
08/01	**Retail Sales Real, YoY**	**Nov**	**-0.6%**	**-0.5%**	**0.8%**	**1.0%**
09/01	**CPI, YoY**	**Dec**	**0.8%**	**0.7%**	**0.9%**	**--**
09/01	**Foreign Reserves, CHF, month**	**Dec**	**750.0b**	**729.0b**	**748.8b**	**749.0b**

United-Kingdon

Date	Indicator	Period	Consensus	Actual	Prior	Revised
08/01	**Halifax House Price Index, MoM**	**Dec**	**0.5%**	**2.2%**	**-1.4%**	**-1.2%**
08/01	**Halifax House Price Index, YoY**	**Dec**	**0.4%**	**1.3%**	**0.3%**	**--**
11/01	**Visible Trade Balance £Mln, month**	**Nov**	**-£11400m**	**-£12023m**	**-£11873m**	**-£11946m**
11/01	**Manufacturing Production, MoM**	**Nov**	**0.4%**	**-0.3%**	**-0.9%**	**-0.6%**
16/01	*CPI, YoY*	*Dec*	*2.1%*	*--*	*2.3%*	*--*
16/01	*Core CPI, YoY*	*Dec*	*1.8%*	*--*	*1.8%*	*--*
17/01	*RICS House Price Balance, month*	*Dec*	*-13.0%*	*--*	*-11.0%*	*--*
18/01	*Retail Sales Inc. Auto Fuel, MoM*	*Dec*	*-0.8%*	*--*	*1.4%*	*--*

Japan

Date	Indicator	Period	Consensus	Actual	Prior	Revised
07/01	**BOJ Annual Rise in Monetary Base**	**Dec**	**5.8%**	**4.8%**	**6.1%**	**--**
07/01	**Monetary Base, End of previous month**	**Dec**	**¥505.8t**	**¥504.2t**	**¥501.6t**	**--**
07/01	**Services PMI, month**	**Dec**	**--**	**51.0**	**52.3**	**--**
18/01	*CPI, YoY*	*Dec*	*0.3%*	*--*	*0.8%*	*--*
18/01	*Industrial production, MoM*	*Nov F*	*--*	*--*	*-1.1%*	*--*

China

Date	Indicator	Period	Consensus	Actual	Prior	Revised
07/01	**Foreign Reserves, month**	**Dec**	**$3071.73b**	**$3072.71b**	**$3061.70b**	**--**
10/01	**CPI, YoY**	**Dec**	**2.1%**	**1.9%**	**2.2%**	**--**
10/01	**PPI, YoY**	**Dec**	**1.6%**	**0.9%**	**2.7%**	**--**
14/01	**Exports, YoY**	**Dec**	**2.0%**	**-4.4%**	**5.4%**	**3.9%**
14/01	**Imports, YoY**	**Dec**	**4.5%**	**-7.6%**	**3.0%**	**2.9%**
14/01	**Trade Balance USD, month**	**Dec**	**$51.60b**	**$57.06b**	**$44.74b**	**$41.86b**
14/01	*M2 Money Supply, YoY*	*Dec*	*8.1%*	*--*	*8.0%*	*--*
14/01	*New Yuan Loans CNY, month*	*Dec*	*825.0b*	*--*	*1250.0b*	*--*
16/01	*New Home Prices,MoM*	*Dec*	*--*	*--*	*1.0%*	*--*

APPENDIX 4 – OUR GROWTH AND INFLATION FORECASTS

GDP GROWTH IN VOLUME (%)	2015	2016	2017	Q1 18	Q2 18	Q3 18	Q4 18f	2018f	C*	Q1 19f	Q2 19f	Q3 19f	Q4 19f	2019f	C*	2020f	C*
United States	2.9	1.6	2.2	2.6	2.9	3.0	3.2	2.9	2.9	2.9	2.6	2.8	2.6	2.7	2.5	2.1	1.9
Eurozone	2.0	1.9	2.5	2.4	2.2	1.7	1.1	1.8	2.0	1.3	1.4	1.5	1.6	1.5	1.8	1.4	1.6
France	1.0	1.1	2.3	2.1	1.7	1.5	1.3	1.6	1.7	1.0	1.6	1.4	1.2	1.3	1.7	1.1	1.6
Germany	1.5	2.2	2.5	2.0	1.9	1.2	1.5	1.7	1.9	1.4	1.6	1.8	1.6	1.6	1.8	1.6	1.5
Spain	3.6	3.2	3.2	2.8	2.5	2.5	2.1	2.5	2.7	2.3	2.5	2.2	1.9	2.2	2.3	1.7	1.9
Italy	0.8	1.3	1.6	1.3	1.2	0.8	0.7	1.0	1.1	0.5	0.6	0.7	0.8	0.7	1.1	0.4	1.0
Luxembourg	4.0	2.4	1.6	3.3	3.1	2.8	3.3	3.1	3.5	3.1	3.1	2.8	2.7	2.9	3.2	2.8	3.0
Portugal	1.8	1.9	2.8	2.2	2.4	1.0	2.0	1.9	2.1	1.5	1.6	1.9	1.8	1.7	1.9	1.5	1.5
Europe ex-Eurozone																	
United Kingdom	2.2	1.8	1.7	1.1	1.2	1.5	1.6	1.3	1.3	1.6	0.6	1.1	0.9	1.1	1.5	0.7	1.6
Switzerland	1.3	1.6	1.7	3.2	3.2	2.7	2.3	2.9	3.0	1.7	1.4	1.6	1.6	1.6	1.7	1.8	1.7
Israel	2.6	3.9	3.3	4.0	3.7	3.1	3.3	3.5	3.5	3.6	3.5	3.5	3.5	3.5	3.4	3.3	3.1
Japan	1.4	1.0	1.7	1.1	1.4	0.4	0.7	0.9	1.1	1.4	1.1	2.2	0.6	1.3	1.1	0.4	0.5
Emerging countries	4.2	3.9	4.8	5.1	4.9	4.7	4.6	4.8	5.0	4.9	5.0	4.8	4.6	4.8	4.9	4.6	5.0
China	6.9	6.7	6.9	6.8	6.7	6.5	6.6	6.7	6.6	6.7	6.7	6.5	6.5	6.6	6.2	6.5	6.0
Brazil	-3.5	-3.5	1.0	1.2	1.0	1.3	1.7	1.3	1.4	2.2	2.2	2.1	2.0	2.1	2.3	2.0	2.5

*Consensus

CONSUMER PRICE INDEX (%)	2015	2016	2017	Q1 18	Q2 18	Q3 18	Q4 18f	2018f	C*	Q1 19f	Q2 19f	Q3 19f	Q4 19f	2019f	C*	2020f	C*
United States	0.1	1.3	2.1	2.2	2.7	2.6	2.6	2.5	2.5	2.6	2.2	2.1	2.3	2.3	2.3	2.3	2.3
Eurozone	0.0	0.2	1.5	1.3	2.0	2.1	2.0	1.8	1.8	2.1	1.7	1.6	1.2	1.6	1.7	1.5	1.7
France	0.1	0.3	1.2	1.7	2.3	2.5	2.5	2.3	2.3	2.5	2.0	1.8	1.6	2.0	2.0	1.6	1.6
Germany	0.2	0.4	1.6	1.5	2.1	1.9	1.8	1.8	1.8	1.9	1.6	1.5	1.5	1.6	1.8	1.6	1.8
Spain	-0.6	-0.3	2.0	1.3	2.3	2.3	2.1	2.0	1.8	2.1	1.8	1.5	1.2	1.7	1.7	1.2	1.6
Italy	0.1	-0.1	1.3	0.9	1.4	1.5	1.5	1.3	1.3	1.6	1.3	1.0	0.9	1.2	1.4	1.0	1.3
Luxembourg	0.1	0.0	2.1	1.2	1.9	2.5	2.7	2.1	1.9	2.3	2.2	1.7	1.5	1.9	2.0	1.8	1.8
Portugal	0.5	0.6	1.6	0.8	2.0	1.8	1.6	1.6	1.4	1.6	1.4	1.4	1.4	1.4	1.6	1.4	1.7
Europe ex-Eurozone																	
United Kingdom	0.1	0.6	2.7	2.4	2.4	2.4	2.0	2.5	2.5	1.8	1.6	1.6	1.6	1.7	2.1	1.8	2.0
Switzerland	-1.1	-0.4	0.5	0.7	1.0	1.1	0.8	0.9	1.0	0.7	0.6	0.6	0.8	0.7	1.0	1.2	1.0
Israel	-0.6	-0.5	0.2	0.2	0.6	1.3	1.2	0.8	0.8	1.1	1.0	1.1	1.2	1.1	1.2	1.4	1.3
Japan	0.8	-0.1	0.5	1.3	0.6	1.1	0.9	1.0	1.0	0.6	1.0	0.9	1.9	1.1	1.1	1.7	1.5
Emerging countries	4.3	3.8	3.0	3.5	3.4	3.8	4.0	3.7	-	4.2	4.4	4.3	4.1	4.3	-	4.0	-
China	1.4	2.0	1.6	2.2	1.8	2.3	2.6	2.2	2.2	2.6	2.7	2.8	2.7	2.7	2.4	2.5	2.3
Brazil	9.0	8.8	3.5	2.8	3.3	4.4	4.6	3.8	3.8	4.6	4.7	4.7	4.5	4.6	4.3	4.3	4.2

*Consensus

APPENDIX 5 – OUR INTEREST RATE AND CURRENCY FORECASTS

INTEREST RATES (%)**	2015	2016	2017	Q1 18	Q2 18	Q3 18	Q4 18f	2018f	C*	Q1 19f	Q2 19f	Q3 19f	Q4 19f	2019f	C*	2020f	C*
United States																	
Benchmark rate	0.50	0.75	1.50	1.75	2.00	2.25	2.50	2.50	2.50	2.75	3.00	3.25	3.25	3.25	3.15	3.25	3.05
2-year yield	0.68	0.83	1.39	2.27	2.53	2.82	2.90	2.63	2.64	3.05	3.20	3.35	3.35	3.24	3.18	3.30	3.31
10-year yield	2.13	1.83	2.33	2.74	2.86	3.06	3.15	2.95	2.97	3.25	3.35	3.40	3.40	3.35	3.38	3.30	3.49
Eurozone																	
Benchmark rate	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.50	0.55
2-year Schatz yield	-0.25	-0.59	-0.72	-0.60	-0.67	-0.52	-0.60	-0.60	-0.58	-0.55	-0.55	-0.40	-0.20	-0.43	-0.30	0.20	0.26
10-year Bund yield	0.54	0.14	0.37	0.50	0.30	0.47	0.50	0.42	0.45	0.60	0.60	0.70	0.85	0.69	0.82	1.15	1.22
2-year OAT yield	-0.18	-0.51	-0.48	-0.49	-0.45	-0.36	-0.40	-0.42	-0.41	-0.35	-0.35	-0.20	0.00	-0.23	-0.06	0.40	0.67
10-year OAT yield	0.86	0.48	0.81	0.72	0.67	0.80	0.83	0.73	0.76	0.90	0.90	1.00	1.15	0.99	1.11	1.45	1.67
United Kingdom																	
Benchmark rate	0.50	0.25	0.50	0.50	0.50	0.75	0.75	0.75	0.75	0.75	0.75	1.00	1.00	1.00	1.10	1.25	1.40
2-year yield	0.54	0.29	0.25	0.82	0.72	0.82	0.80	0.79	0.82	0.80	0.85	0.95	1.00	0.90	1.15	1.35	1.63
10-year yield	1.82	1.22	1.20	1.35	1.28	1.57	1.57	1.44	1.43	1.60	1.65	1.70	1.80	1.69	1.82	2.10	2.16
Switzerland																	
Benchmark rate	-0.75	-0.75	-0.75	-0.75	-0.75	-0.75	-0.75	-0.75	-0.75	-0.75	-0.75	-0.75	-0.75	-0.75	-0.50	-0.25	-0.30
2-year yield	-0.89	-0.91	-0.85	-0.85	-0.74	-0.70	-0.75	-0.76	-0.73	-0.70	-0.70	-0.45	-0.25	-0.53	-0.31	0.05	0.15
10-year yield	-0.09	-0.35	-0.09	0.03	-0.06	0.04	0.05	0.01	0.02	0.10	0.15	0.30	0.45	0.25	0.37	0.75	0.75
Japan																	
Benchmark rate	0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	0.00	-0.10	0.00
2-year yield	0.01	-0.21	-0.17	-0.13	-0.12	-0.11	-0.10	-0.11	-0.11	-0.10	-0.05	-0.05	-0.05	-0.06	-0.06	0.00	-0.03
10-year yield	0.36	-0.04	0.06	0.05	0.04	0.13	0.15	0.09	0.08	0.15	0.15	0.25	0.25	0.20	0.15	0.35	0.15
Emerging countries																	
Benchmark rates China																	
1 year lending rate	4.35	4.35	4.35	4.35	4.35	4.35	4.35	4.35	4.35	4.35	4.35	4.35	4.35	4.35	4.30	4.35	4.10
Reserve Requirement Ratio	17.50	17.00	17.00	17.00	16.00	15.50	14.50	14.50	-	13.50	13.50	13.50	13.50	13.50	-	13.50	-
Benchmark rate Brazil	14.25	13.75	7.00	6.50	6.50	6.50	6.50	6.50	6.65	7.00	7.50	7.75	8.00	8.00	8.20	8.00	7.85

*Consensus ** Sovereign bond yields shown are averages for the annual periods and period-end figures for the quarterly periods

EXCHANGE RATE**	2015	2016	2017	Q1 18	Q2 18	Q3 18	Q4 18f	2018f	C*	Q1 19f	Q2 19f	Q3 19f	Q4 19f	2019f	C*	2020f	C*
Dollar																	
EUR/USD	1.08	1.11	1.13	1.23	1.19	1.16	1.14	1.18	1.18	1.13	1.12	1.14	1.16	1.14	1.24	1.20	1.26
USD/JPY	120	109	112	108	109	112	114	111	110	114	115	115	114	115	109	113	104
GBP/USD	1.47	1.36	1.29	1.39	1.36	1.30	1.30	1.34	1.34	1.29	1.28	1.29	1.30	1.29	1.38	1.30	1.42
USD/CHF	1.01	0.98	0.98	0.95	0.98	0.98	1.00	0.98	0.98	1.02	1.03	1.03	1.02	1.02	0.95	1.00	0.96
USD/CNY	6.28	6.65	6.75	6.36	6.38	6.81	6.96	6.63	6.62	6.88	6.76	6.65	6.65	6.74	6.75	6.65	6.57
USD/BRL	3.34	3.48	3.19	3.24	3.61	3.95	3.76	3.64	3.63	3.70	3.65	3.65	3.65	3.66	3.65	3.65	3.75
Euro																	
EUR/JPY	130	121	127	133	130	130	130	131	130	129	129	131	132	130	135	136	131
EUR/GBP	0.73	0.81	0.88	0.88	0.88	0.89	0.88	0.88	0.88	0.88	0.88	0.88	0.89	0.88	0.90	0.92	0.89
EUR/CHF	1.09	1.09	1.11	1.17	1.17	1.14	1.14	1.15	1.16	1.15	1.15	1.17	1.18	1.16	1.18	1.20	1.21

*Consensus **Period average

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