Moody's Analytics

ANALYSIS

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Forecast Accuracy: International

Executive Summary

This document provides an assessment of the accuracy of the Moody's Analytics projections of key economic indicators made in late 2017 for 2018. They include global aggregates of pivotal variables such as the growth rate of world real GDP, real con-sumption spending, real exports, industrial production, employment, and inflation, as well as individual country GDP growth forecasts. It describes our thinking and as-sumptions in late 2017 as we considered the outlook for 2018, and compares our forecast with what actually transpired.

This document contains a subset of information from the complete report available to subscribers.

Forecast Accuracy: International

BY JUAN PABLO FUENTES, GUILLAUME KHAYAT, BRITTANY MEROLLO, KATRINA ELL, AND EVAN KARSON

Moody's Analytics provides economic projections covering core indicators for some 100 countries and regions around the world. Representing more than 95% of world GDP on a purchasing power parity basis, they include major advanced countries such as the U.S., Japan, Germany, the U.K., France, Italy, Spain and Canada; key emerging markets such as China, India, Brazil, Argentina, Mexico, Russia and South Korea; and other developed and emerging market countries.

Important indicators in the Moody's Analytics country models include national income, production, and aggregate demand variables such as GDP, private consumption, fixed investment, government consumption, exports and imports; price indicators, including the consumer price index, producer price index, and GDP deflator; labor market indicators such as the unemployment rate, employment and labor force; industrial production; and financial market indicators such as money supply, domestic credit, monetary policy rate, Treasury bill rate, exchange rate, and benchmark stock price index.

This article provides an assessment of the accuracy of the Moody's Analytics projections of key economic indicators made in late 2017 for 2018. They include global aggregates of pivotal variables such as the growth rate of world real GDP, real consumption spending, real exports, industrial production, employment, and inflation, as well as individual country GDP growth forecasts. It describes our thinking and assumptions in late 2017 as we considered the outlook for 2018, and compares our forecast with what actually transpired.

Forecast assumptions

Moody's Analytics correctly predicted that the Federal Reserve would hike the policy interest rate four times in 2018 amid a robust economy. The U.S. economy benefited, as expected, from fiscal stimulus in 2018, though some deceleration occurred later in the year amid increasing trade tensions between China and the U.S. Our assumption for a slightly stronger U.S. dollar was also mostly on target during 2018.

We had expected a slowdown across the euro area in 2018. The discrepancies between our forecast and the actual readings were most prominent in the second half of the year partly because of slowing domestic factors, including the disruption of car production in the third quarter and social tensions and fiscal policy uncertainty in some member countries. Global trade also dealt a larger blow than expected. Increased uncertainty regarding trade policies, notably between the U.S. and China, and a declining trend in global manufacturing output translated into weaker global trade growth.

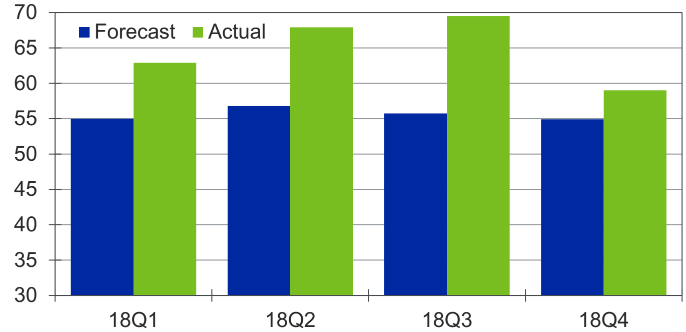
We also projected a slight slowdown in China, as Beijing focused on addressing increasing financial risks that could hinder sustainable growth in the future. An additional drag on growth was the trade war with the U.S., which first caused a pullback in manufacturing sentiment in China and then spilled over to the weaker real economy.

Latin America was expected to benefit from improving business sentiment and higher commodity prices in 2018. Similarly, a solid global economy was expected to boost demand for its exports. The Brazilian economy, in particular, was expected to rebound amid an improving political climate and more policy certainty. Yet the recovery proved weaker than anticipated because of lingering political uncertainty and unexpected turbulence in international financial markets. Similarly, the Mexican economy performed worse than expected amid increased policy uncertainty and the debate over the renegotiation of NAFTA.

Oil prices were expected to continue rising in 2018, as OPEC and Russia extended their agreement to limit output. Similarly, we forecast sanctions and ongoing security issues to continue hindering output in Iran, Libya and Venezuela. Meanwhile, Moody's Analytics projected global oil demand to expand at a robust pace again in 2018 amid a solid global economy. Those assumptions were mostly met, leading to a rise in oil prices in 2018. Yet the rise was stronger than expected, mostly because of OPEC's surprising restraint. OPEC exceeded its cut agreement for most of 2018, partly as a result of declining output in Venezuela and some African members. Saudi Arabia started to compensate for those declines only in the last few months of the year. As a result, the price of West Texas Intermediate averaged $64.80 per barrel in 2018, compared with earlier expectations for $55.60 per barrel (see Chart 1). Thus, WTI rose 27% in 2018, compared with earlier expectations for a 9% increase.

Chart 1: Oil Price Is Above Forecast

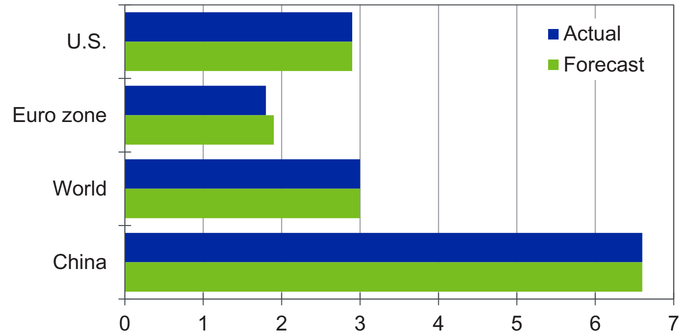
Price of West Texas Intermediate, $ per bbl



Sources: EIA, Moody's Analytics

Chart 2: U.S. and China on Target

Real GDP, 2018, % change



Source: Moody's Analytics

The price for industrial metals also increased in 2018. The rebound was somewhat stronger than forecast because of robust demand from Asia and lagging supply.

Global accuracy

In late 2017, Moody's Analytics expected the world economy to grow at a steady pace in 2018, and for the most part this was correct: World GDP rose by 3% in 2018, as predicted, compared with 3.1% in 2017. Growth was as expected in the U.S. and China, and only slightly below expectations in Europe (see Table 1). The Latin American economy grew below expectations in 2018, but this was offset by stronger than forecast growth in Africa, the Middle East, and developing Europe. Outside of China, developing Asia performed mostly as expected. Global consumption growth was underestimated by 0.2 percentage point because of stronger than expected growth in China and the rest of Asia. World real export growth was also stronger than projected, supported by Asia and Europe. Industrial production growth was slightly below expectations in 2018. Indicative of a continued improvement in productivity growth, our forecast of employment growth was slightly below the actual reading for 2018, despite on-target GDP growth.

Overall forecast accuracy was outstanding in 2018. The mean absolute percent error of the global forecast declined to just 0.1% (see Table 2), the lowest since at least 2005. The absolute percent error is calculated by first taking the absolute value of the difference between projected and actual growth rates, and then dividing by the standard error of GDP growth over a 10-year period.

Although we correctly predicted the strength of the global economy in 2018, the distribution of growth denoted some miscalculations. Disaggregating by regions, we overestimated growth in Latin America, Canada, and parts of the European Union, but underestimated growth in Africa, the Middle East, developing Asia, and developing Europe. We correctly forecast growth rates in China and the U.S. (see Chart 2) despite lingering worries about the impact of trade disputes

Table 1: Global Key Indicators Growth Forecast Accuracy

% change

	Late-2017 forecast of 2018 growth	Actual 2018	Difference
World			
Real GDP growth	3.0	3.0	0.0
Real consumption growth	2.6	2.8	0.2
Real export growth	3.9	4.3	0.4
Inflation rate, %	3.4	4.3	0.9
Industrial production	3.1	3.0	-0.1
Employment growth	1.2	1.0	-0.2

Source: Moody's Analytics

Table 2: Global GDP Growth Forecast Accuracy

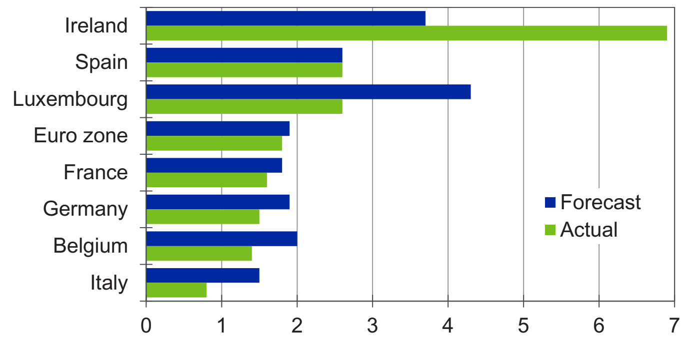
Actual vs. outlook published late in prior yr

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Mean absolute percentage error	0.88	0.76	1.11	1.93	2.77	1.51	0.58	0.82	0.20	1.05	1.09	0.75	0.69	0.10
Rank correlation coefficient	0.63	0.80	0.82	0.73	0.82	0.91	0.95	0.81	0.88	0.58	0.73	0.76	0.69	0.79

Source: Moody's Analytics

Chart 3: Mixed Surprises in the Euro Zone

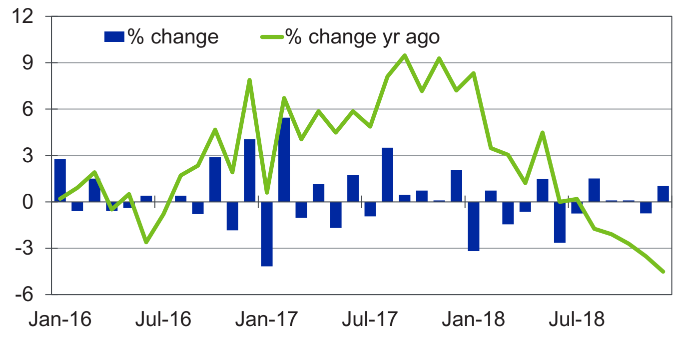
GDP growth, 2018, % change



Sources: Eurostat, Moody's Analytics

Chart 4: German Manufacturing Sours

Germany factory orders, volume, SA



Sources: DESTATIS, Moody's Analytics

between the two countries and other policy uncertainties.

European forecast accuracy

Last year, the euro zone largely tracked Moody's Analytics expectations, but there were a few surprises for individual countries. Our forecast from late 2017 projected the area's economy to grow by 1.9% in 2018, but it actually expanded by 1.8%, the slowest pace in five years. While we had forecast a slowdown across the euro area in 2018, the discrepancies between our forecast and the actual readings were most prominent in the second half of the year because of certain factors. These include the disruption of car production in the third quarter, and social tensions and fiscal policy uncertainty in some member countries. Global trade also dealt a larger blow than expected. Increased uncertainty regarding trade policies, notably between the U.S. and China, and a declining trend in global manufacturing output translated into weaker global trade growth.

Households were generally better off across the rest of the euro zone. The tight labor market lifted wages while inflation lost ground, boosting consumers' purchasing power. Consumption in the fourth quarter of 2018 was particularly surprising. The 0.2% quarter-over-quarter increase was unimpressive, but it was much better than expected given the expected sharp declines in car sales and energy spending on the back of one-off and seasonal factors.

Most major economies in the area were just shy of expectations, but there were a few surprises (see Chart 3). Luxembourg was the largest surprise on the downside with 2018 growth coming in at 2.6% compared with our initial forecast of 4.3%. Investment and net exports were largely responsible for the weaker expansion. As a small open economy with strong trade and financial links in international markets, the country was especially exposed to softer global growth and trade disruptions.

Italy came in second place in forecast error on the downside with actual growth that was 0.7 percentage point lower than our 1.5% expectation. As with most other European countries, misses were largely prominent in the second half of the year. This can be attributed to falling net exports from less dynamic world trade and sluggish domestic demand. Increased political uncertainty discouraged spending and investment mostly in the third quarter. Ongoing weakness in manufacturing also played a role in the above-average forecast error, with Italy's Markit manufacturing PMI below the critical neutral threshold since October.

Belgium, Germany and France were also expected to grow at a faster pace than reported, while Spain's forecast was spot-on. Belgium's growth came in 0.6 percentage point lower than our forecast of 2% mainly because of slower private consumption and investment growth as sentiment indicators deteriorated. Consumer spending rose just 0.6% in 2018 from 1.1% in 2017.

Germany's forecast error was slightly better, with actual growth coming in at 1.5% compared with our expectation of 1.9%. The German economy unexpectedly hit a speed bump in the second half of the year. Behind the less than stellar result was weakness in net exports. Brexit and the trade war between China and the U.S. weighed on German exports, which have propelled the economy's expansion in the last few years. Weakness in exports in the second half of the year happened just as the euro was depreciating against the U.S. dollar, a sign that global developments had dampened demand for German exports outside the currency area despite their improving competitiveness.

Germany's manufacturers took the largest hit from the weakened external environment, with total new orders and export sales in the falling quickly (see Chart 4). Auto manufacturing took a tumble in the third quarter because of new EU regulations on pollution standards, which hurt sales of new models across Europe as automakers struggled to gain regulatory clearance (see Chart 5).

Germany narrowly avoided a technical recession in the second half of 2018. After contracting by 0.2% quarter over quarter in the third quarter, real GDP stalled in the fourth quarter. Though we had not expected such a decline in the country's external sector, the services sector at home hummed along as expected thanks to healthy household finances.

France's GDP growth came in at 1.6%, 0.2 percentage point shy of our forecast. The forecast error was the greatest in the fourth quarter, as 'yellow vests' social protests dinged consumer confidence and private consumption and investment (see Chart 6). However, net trade saved the day. Exports

Table 3: Global Real GDP Growth Forecast Accuracy

% change yr ago

	Late-2017 forecast of 2018				Actual 2018			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
North America								
United States	2.9	3.0	2.8	2.7	2.6	2.9	3.0	3.0
Canada	2.7	2.3	2.4	2.3	2.2	1.7	1.9	1.6
Mexico	1.6	1.9	2.9	3.6	2.1	1.5	2.5	1.7
South America								
Argentina	3.7	3.8	3.1	3.0	3.6	-2.5	-4.4	-6.5
Brazil	2.1	2.5	2.5	2.3	1.2	0.9	1.3	1.1
Chile	2.8	3.0	1.8	2.4	4.7	5.3	2.6	3.6
Colombia	3.3	3.0	2.8	2.4	2.2	2.6	2.9	2.9
Peru	3.3	3.5	3.4	3.8	3.2	5.5	2.4	4.9
Venezuela	-6.9	-6.5	-6.2	-6.0	-10.6	-14.1	-18.2	-21.4
Uruguay	0.9	3.6	3.5	3.3	1.9	2.2	1.9	0.6
Euro zone	**2.3**	**2.0**	**1.8**	**1.7**	**2.4**	**2.1**	**1.6**	**1.1**
Austria	2.4	2.1	1.6	1.6	3.2	3.2	2.8	2.1
Finland	1.4	0.9	0.8	1.0	2.2	2.1	2.1	2.2
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This document contains a subset of information from the complete report available to subscribers.

The complete fifteen page forecast accuracy document is available to clients of Moody's Analytics global economic forecasts. Please contact help@economy.com to learn more about our global macroeconomic model and forecasts.