



Rabobank

Coronavirus: Outbreak of Uncertainty

Four scenarios, none of them good

RaboResearch

Global Economics & Markets

mr.rabobank.com

[Michael Every](#)

Senior Strategist, Asia-Pacific
+852 2103 2612

[Raphie Hayat](#)

Senior Economist, China and ASEAN
+31 88 7253710

[Elwin de Groot](#)

Head of Macro Strategy
+ 31 30 712 1322

Summary

- The Covid-19 coronavirus could be more disruptive than markets are currently pricing in. Not in the least because the 'true' number of infected people remains uncertain, as the recent surge in cases exemplifies
- We outline four scenarios in which the virus increasingly becomes severe: The Bad; The Worse; The Ugly; and The Unthinkable
- We provide rough estimates for China's growth trajectory in these scenarios although we stress that these are not our official forecasts since we are still working out the details
- The three main channels through which Covid-19 will affect the global economy are tourism, net exports, and intermediate goods
- In the 'Bad' scenario the virus outbreak does not last far beyond Q1. China's GDP growth for 2020 could drop to below 5%, with production taking the biggest hit and a catch up in Q3 and Q4. This is our base case scenario, although with the recent surge in mind, the second scenario is becoming increasingly likely
- In the 'Worse' scenario, the virus outbreak lasts beyond Q1. In that case China's GDP growth could end up below 4% in 2020
- In this scenario, next to China, Asia will bear the brunt of the prolonged outbreak due to its dependence on China as an export market and intermediate imports as well as for tourism
- In China itself, defaults of non-financial corporates in China could start to rise rapidly
- This will lead to a decline in China's long-term growth potential as private companies will suffer most, while less efficient SOEs will likely be bailed out. As a result, debt levels will balloon further, leaving China more vulnerable in the future
- There will also be downwards pressure on the Chinese currency as extra CNY liquidity is made available
- In the Ugly scenario, the virus spreads beyond China, and spreads to Asia as well as developed economies. Its effects will likely resemble the Global Financial Crisis of 2008/2009 more than the SARS outbreak in 2003
- The Unthinkable scenario is a far left tail scenario, in which the virus mutates and becomes a truly global pandemic

Risk on?

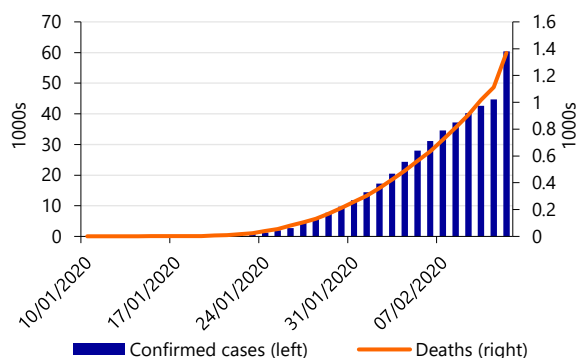
Financial markets have been on a roller-coaster ride since the Novel coronavirus Covid-19 stole the headlines – albeit mainly on the ascent phase (bar today's reaction) of the ride so far in terms of equities at least. At this stage, it's still too early to tell whether or not Covid-19 is 'under control' or not. Especially given that the most surge in cases (due to a new counting methodology) shows that we don't really know the actual number of infected cases (Figure 1).

In a research report published end-January we [discussed](#) the 'most likely' outcome for the global economy and markets based on what we knew at the time. But the huge uncertainty surrounding the spread of the virus as well as its impact on economic behaviour implies that we are still dealing with a wide range of possibilities from a relatively quick stabilization of the situation to a full-blown pandemic with far far-reaching consequences.

This report will therefore examine what the potential impact of the virus will be on the Chinese, Asian, and global

economies under four different scenarios. As shall be seen, *none* of these are positive, in contra-distinction to the relative optimism shown by equity markets at present. In fact, all of them are negative to varying degrees such that we dub them: The Bad; The Worse; The Ugly; and The Unthinkable.

Figure 1: Cases surge due to new counting methodology



Source: Macrobond, China National Health Commission, Johns Hopkins University CSSE

The Bad

This scenario is actually the ‘good’ one that markets are apparently pricing for, which would see a quick stabilization of the situation in China and assumes that the international spread of the virus remains limited to a number of countries, notably in the Asian region, but with *no repeat* of the swift spread we initially saw on mainland China.

This is a relatively benign scenario with the economic effects mostly concentrated in Q1 and part of Q2 2020. Regardless, we still **envisage that China’s Q1 growth rate in this scenario could fall to 2.9% y-o-y, which is 3% lower than our previous forecast of 5.9%**. Assuming the most draconian containment measures are gradually withdrawn during Q2, the impact on Q2 growth is likely to be smaller but still negative. Only in H2 would we expect a partial rebound. **For 2020, our ballpark growth figure is 4.8% - 5.6% y/y GDP growth, and then and between 5.5% - 6.3% for 2021. (These are not our official forecasts. We are still working out the details and will present them in our upcoming quarterly outlook).**

We expect Chinese industrial production to take the biggest hit near-term as factories remain mostly closed in Q1. Production growth in this scenario will drop to 2.2% y-o-y in the quarter, which is 4% below its 3-year average (6.1% y/y). However, there will likely be some catch-up growth in production in Q3 and Q4.

Services will take the second largest hit, slowing to 3.5% y-o-y, which is 3 percentage points below its 3-year average

(7.5% y/y). Services will rebound too in H2, albeit partially. We say partially because while industrial production may “catch-up”, consumer spending is less likely to do so. People will not get an extra haircut or go on vacation twice to catch up on missed haircuts and vacations. **Crucially, the services sector now comprises more than half of China’s economy (52%); in 2003 this was just 42%.**

In terms of stimulus, we can naturally expect both fiscal and monetary policy to play a large role. The PBOC has already injected a significant quantity of liquidity via various channels, including reverse repo, totalling CNY2.9 trillion (USD 414 bn) at the time of writing (although a large part of this injection is for refinancing of previously ending contracts). More will be forthcoming, in their own words. Interest rates, such as where they matter in a quantity-driven credit economy like China, will also be lowered.

At the same time, the fiscal taps will have to open. We are again already seeing accelerated issuance of local government special bonds, and the central government fiscal deficit will also widen as needed to ensure the economy gets back on track as soon as possible.

However this is not a cost-free exercise. Already-high debt-ratios of corporates and the state in China will rise even higher. The narrative of deleveraging, which we did not subscribe to, will be comprehensively debunked. China will have to carry that debt with it in the future.

Concurrently, this new stimulus runs counter to China’s ambition to make its financial system more stable. Chinese banks already face rising non-performing loan (NPL) levels. For example, S&P estimate that in a growth slow-down these could multiple five or six fold, into the hundreds of USD billions. The actual, rather than realised, figure is likely to be far worse.

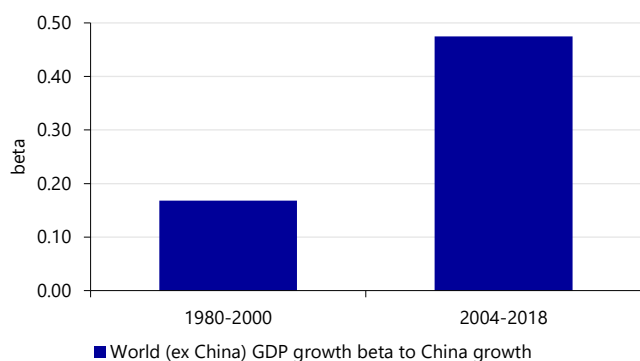
Crucially, China’s banks are also already capital constrained. Having to step in and support so much of the economy will almost certainly see them having to raise capital or rely on the PBOC. Indeed, in almost all scenarios the PBOC will be doing much more ahead.

In which case, a combination of increased CNY liquidity and lower Chinese rates, to say nothing of a drop in capital inflows, is likely to place significant downwards pressure on CNY. Might this even limit the PBOC’s room for action given China’s commitment to the US under the Phase One Trade Deal not to weaken its currency? Notably, the US is already recognising that there will be delays in China meeting its other promise, of huge US goods purchases.

For the global economy this scenario is also painful as China has become a critical driver of global economic

growth. The sensitivity of the world economy to China's growth rate was 0.17 between the 1980s and 2000, which has almost tripled to 0.47 in the last 15 years. Thus each percentage point of Chinese GDP growth coincides (we don't say 'leads to') with about half a percentage point in world GDP growth (Figure 2). This scenario will see 2020 world GDP growth -0.2ppts lower than our current estimate of 2.9%.

Figure 2: Global growth is more sensitive to China's growth



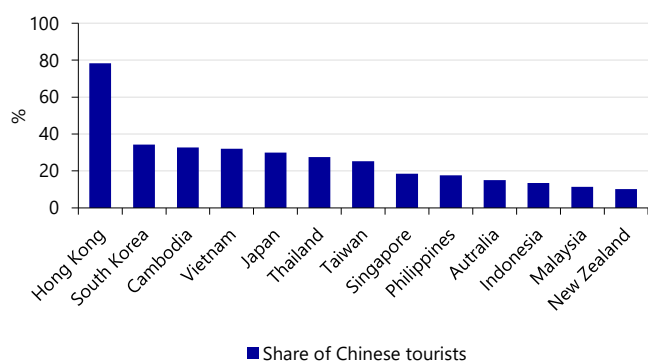
Source: Macrobond, Rabobank calculations

The economic transmission mechanisms are as clear as those of the virus.

Automatic transmission

On the demand side, China is responsible for more than 25% of tourists in a host of countries such as South Korea, Vietnam and Thailand, but also Australia, New Zealand, and Hong Kong (Figure 3). It also sends millions of tourists further afield, to Europe and the US, for example. Naturally, a decline in Chinese tourists will hit hardest for the countries where tourism is largest as a share of GDP.

Figure 3: Chinese tourists matters to Asia, and everyone



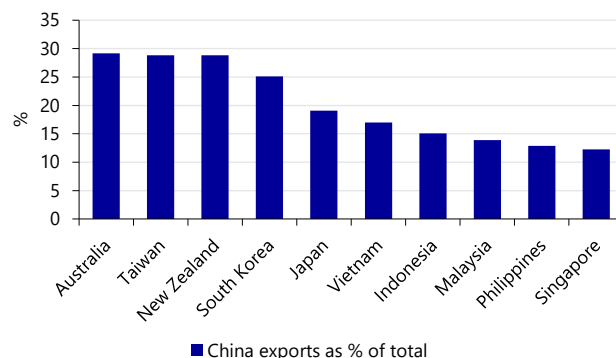
Source: Macrobond

Thai tourism, for example, constitutes 20% of GDP and employs about 10% of the workforce. Chinese tourists alone account for about 6% of Thai GDP. Indeed, the virus is already hitting Thailand hard as seen from anecdotal

reports from Thai resorts and Bangkok, which is a popular destination for visitors from Wuhan.

The second channel of demand-based transmission is exports. **For Australia, New Zealand, Taiwan, and South Korea, more than 25% of exports go to China; for Hong Kong this figure is as high as 78%** (Figure 4).

Figure 4: China matters to Asia (and everyone) for exports

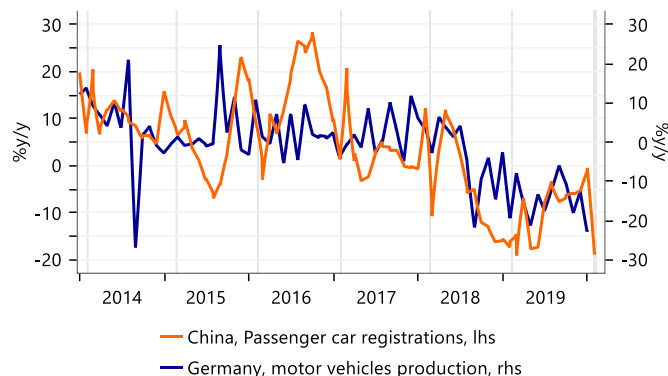


Source: Trademap.org, Rabobank calculations

Even Europe cannot escape: 7% of Germany's exports (EUR 96 bln) go to China, a quarter of which are cars. The rest of Asia constitutes 11% of German exports. Thus a full 18% of German exports will be hit directly or indirectly be less demand from China as well as disruption of transport routes. With German automotive output already at its lowest level since 2010 (Figure 5), significant weakness in Chinese demand could be a serious headwind for Germany.

The third transmission channel is indirect, and potentially just as disruptive: a supply shock. China is a vital part of international value chains and international firms rely on Chinese intermediate goods to produce their end products. Thus, a disruption in Chinese output means these companies are unable to produce their final goods, or at least face delays in production, depending on when production in China can be re-started.

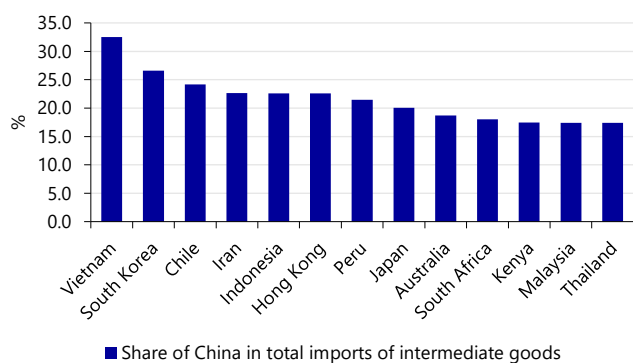
Figure 5: German car output was still sliding in December



Source: Macrobond, Bloomberg

On a macro level **countries such as Vietnam, South Korea and Indonesia are especially prone to this** (Figure 6), and in Europe so is Germany: **about 9% of Germany's total import of intermediate goods is from China.** Germany's car sector could thus feel the effects of the coronavirus via its exports to China, which will be hit, as well as in the difficulty getting of getting key imports from China in order to *produce* the cars.

Figure 6: China matters to Asia for intermediates



Source: World Bank WTT database, Rabobank calculations

Indeed, we have already seen several major Korean firms such as Hyundai and Kia shut down some local production due to lack of inputs from China, with consequent spill-over effects on to their own national supply-chains.

It should also go without saying that this trend is also playing out within China itself: China is vastly more correlated with China than it is with the rest of the world! Indeed, the under-appreciated risks of long- and China-centric supply chains are being underlined by the current crisis.

Longer-term impact

One also needs to consider the longer-term structural damage that will be seen the longer the virus is present for. The Chinese government will naturally aim to bail out its large State-Owned Entities (SOEs) if they suffer; but could it really do the same for private companies, SMEs, or for indebted households? That seems far less achievable. How far can the state really prop up the domino effect of cascading small and medium firm failures? How can it make households good short of suspending mortgage payments, for example, or huge increases in welfare spending, which China does not currently have systems in place for?

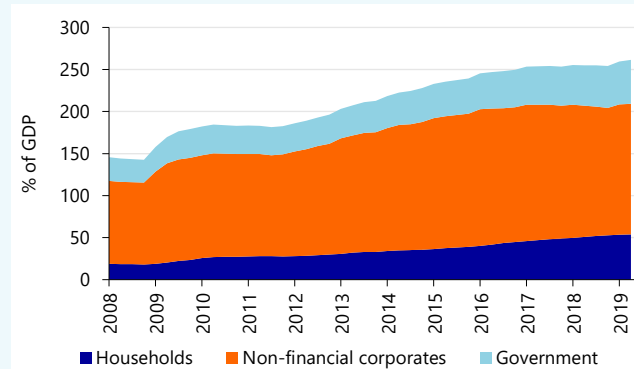
As such, Chinese GDP growth may only be sustained by a deepening of state activity and PBOC activism. The long-term effects of this kind of bail-out at a time when China is ostensibly supposed to be reforming would be that

the Chinese economy as whole becomes less efficient in terms of its investment, which is already a key problem. This would mean a short-term stimulus sitting alongside a reduction China's long term growth potential.

In addition, and as we already noted, either China's government debt will balloon because of large bailouts of even-more indebted firms and households, at a time when this is already becoming an issue of concern. Note that the combined debt of non-financial corporates, the government and households has already reached 260% of GDP (Figure 7).

The Chinese currency could come under increased downwards pressure in financial markets as well, due to the massive extra CNY liquidity and matching lower Chinese rates.

Figure 7: An already ballooning belly of debt



Source: Institute of International Finance (IIF)

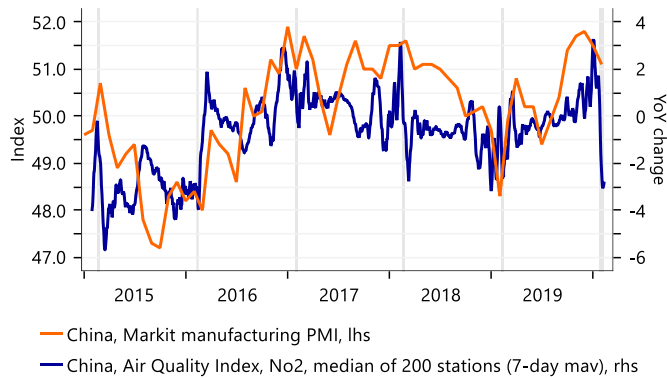
The Worse

In 'The Worse' scenario the virus spreads further within China and lasts longer than in the previous scenario (6-9 months).

Within China, the economic impact will naturally be amplified, with only a partial bounce-back in H2 2020. The pressures on the Chinese government, corporates, and households if nobody is able to work for an extended period, and *then* on its banks and through to CNY, would increase by orders of magnitude.

In order to ascertain how likely this outcome is, one can arguably track real-time day-to-day air quality data looking at Nitrous Dioxide (NO₂) levels in major Chinese cities, as a proxy for the polluting effects of economic activity. What can be seen at time of writing matches anecdotal descriptions of a property market in deep-freeze, ghost cities, and shuttered factories.

Figure 8: Praying for some pollution!



Source: Macrobond, Bloomberg, aqicn.org, Rabobank
Note: grey bars are lunar holidays (+extension in 2020)

Assuming a longer, deeper virus impact we see China's GDP growth for 2020 in a 3.8%-4.6% y/y range. Again production will take the largest hit because factories will be shut down longer. Services will take the secondary hit. Moreover, the global effect will be far stronger: global growth could decline by a full 1% in 2020. However, we do expect some rebound in late Q3 and in Q4, although the recovery in services will be relatively less due to an extended period of negative sentiment.

The Ugly

This 'Ugly' scenario would see the virus continue to rage in China, spread to ASEAN, Australia and New Zealand, and the cluster of cases in the US and Europe snowball at an exponential growth rate from their currently low base. In other words, developed economies would also be hit.

If the virus spreads in the West public panic would naturally be the immediate response. Just as seen in China today, people would stop going out and shopping to stay safe at home, or make panic purchases on fears of supply shortages and then stay at home. In short, the economy would largely grind to a halt.

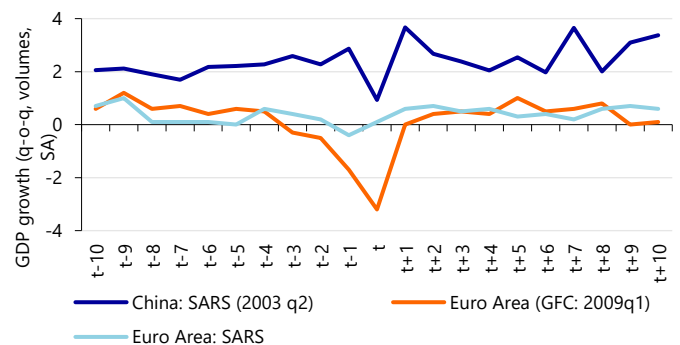
Naturally, the services sector on which the West relies far more than China would be smashed: restaurants; pubs; bars; cinemas; concerts; conferences would all grind to a halt. International travel bans would be put in place. Supply chains would be broken. International trade would collapse along with domestic demand.

The government would immediately start to institute similar quarantine steps as seen in China. Regardless of the differences in political systems, quarantine is quarantine (and the word originates from Venice, after all). Presuming this was ineffective due to earlier symptom-free transmission then the quarantine would have to be

expanded. We could expect a mirror of the Chinese villages building barriers around themselves to keep strangers out.

In this kind of scenario it is impossible to estimate the precise impact on the global economy – because there would be little *global* economy to speak of. Suffice to say, it would be a true depression: a sharp downturn like in 2008-09 that grinds on - and a recovery based on medical breakthroughs rather than monetary-policy ones.

Figure 9: The effects of the Ugly scenario will resemble the GFC more than SARS



Source: Macrobond

Nonetheless, interest rates would obviously be slashed, where they can, and emergency government spending on anti-virus measures would be stepped up regardless of the size of fiscal deficits. At the same time banks would be told by central banks to keep supporting all firms, especially SMEs, that are facing bankruptcy as their revenues evaporate.

Yet would banks listen to their new orders to lend? Which staff would be doing this, if nobody is in the office? Banks haven't done much real-economy lending under QE liquidity and no virus conditions, for example. Firms themselves would be told to keep paying their workers even if they can't do any work – but as in China, would SMEs be able to afford to? And what about the gig economy and the huge number of self-employed?

As such, the state would be forced to expand its role markedly in order to stop a total economic collapse – once again, as in China. This would be akin to current populist arguments for a fiscal-QE-driven 'Green New Deal', but in this case wrapped up in biosecurity terms. However, our health and armed forces (which would be needed to keep control) are arguably over-stretched and under-resourced already in many countries, and are not something that can be turned on/off quickly like a switch.

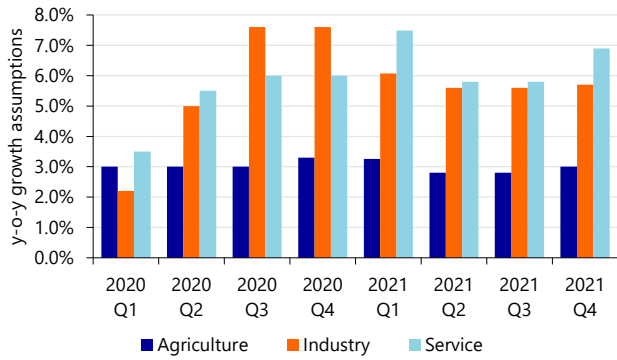
The Unthinkable

This scenario is very short. The virus spreads globally and also mutates, with its transmissibility increasing and its lethality increasing too. The numbers infected would skyrocket, as would casualties. We could be looking at a **global pandemic**, and at scenarios more akin to dystopian Hollywood films than the realms of economic analysis. Let's all pray it does not come to pass and just remains a very fat tail risk.

However, one can see that in each of these four scenarios things are ugly, even in the first two ones. As such, the relative financial market optimism still seems to be based on the belief that central-bank liquidity supersedes virus transmissibility. That's still quite optimistic given the uprise in uncertainty about the coronavirus.

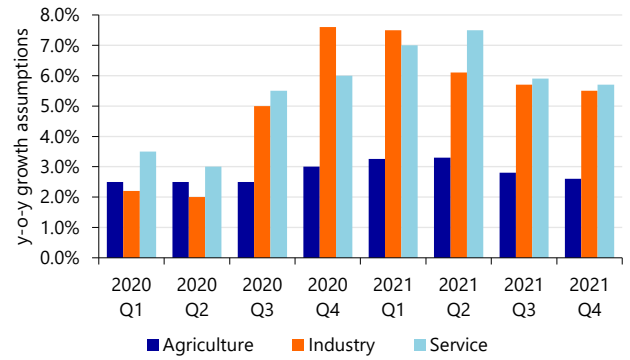
Appendix: Assumptions

Figure 10: Growth assumptions for mid-point outcomes of the 'Bad' scenario



Source: Rabobank

Figure 11: Growth assumptions for mid-point outcomes of the 'Worse' scenario



Source: Rabobank

RaboResearch

Global Economics & Markets

mr.rabobank.com

Global Head

Jan Lambregts

+44 20 7664 9669

Jan.Lambregts@Rabobank.com

Macro Strategy

Europe

Elwin de Groot

Head of Macro Strategy

Eurozone, ECB

+31 30 712 1322

Elwin.de.Groot@Rabobank.com

Stefan Koopman

Senior Market Economist

UK, Eurozone

+31 30 712 1328

Stefan.Koopman@Rabobank.com

Teeuwe Mevissen

Senior Market Economist

Eurozone

+31 30 712 1509

Teeuwe.Mevissen@Rabobank.com

Bas van Geffen

Quantitative Analyst

ECB

+31 30 712 1046

Bas.van.Geffen@Rabobank.com

Maartje Wijffelaars

Senior Economist

Italy, Spain, Portugal, Greece

+31 88 721 8329

Maartje.Wijffelaars@Rabobank.nl

Erik-Jan van Harn

Economist

Germany, France

+31 6 30 020 936

Erik-Jan.van.Harn@Rabobank.nl

Wim Boonstra

Senior Advisor

+31 30 216 2666

Wim.Boonstra@Rabobank.nl

Americas

Philip Marey

Senior Market Strategist

United States, Fed

+31 30 712 1437

Philip.Marey@Rabobank.com

Hugo Erken

Head of International Economics

United States

+31 88 721 5260

Hugo.Erken@Rabobank.nl

Christian Lawrence

Senior Market Strategist

Canada, Mexico

+1 212 808 6923

Christian.Lawrence@Rabobank.com

Gabriel Santos

Strategist

Brazil

+55 11 5503 7288

Gabriel.Santos@Rabobank.com

Asia-Pacific

Michael Every

Senior Market Strategist

Asia, Australia, New Zealand

+852 2103 2612

Michael.Emily@Rabobank.com

Björn Giesbergen

Senior Economist

China, Japan

+31 88 724 8233

Bjorn.Giesbergen@Rabobank.nl

Hugo Erken

Head of International Economics

India

+31 88 721 5260

Hugo.Erken@Rabobank.nl

Raphie Hayat

Senior Economist

+31 30 216 2666

Raphie.Hayat@Rabobank.nl

FX Strategy

Jane Foley

Head of FX Strategy
G10 FX
+44 20 7809 4776
Jane.Foley@Rabobank.com

Piotr Matys

Senior FX Strategist
Central & Eastern Europe FX
+44 20 7664 9774
Piotr.Matys@Rabobank.com

Christian Lawrence

Senior Market Strategist
LatAm FX
+1 212 808 6923
Christian.Lawrence@Rabobank.com

Rates Strategy

Richard McGuire

Head of Rates Strategy
+44 20 7664 9730
Richard.McGuire@Rabobank.com

Lyn Graham-Taylor

Senior Rates Strategist
+44 20 7664 9732
Lyn.Graham-Taylor@Rabobank.com

Matt Cairns

Senior SSA Strategist
+44 20 7664 9502
Matt.Cairns@Rabobank.com

Credit Strategy & Regulation

Ruben van Leeuwen

Head of Credit Strategy
ABS, Covered Bonds
+31 30 712 1391
Ruben.van.Leeuwen@Rabobank.com

Vaclav Vacikar

Analyst
Financials
+31 30 712 1519
Vaclav.Vacikar@Rabobank.com

Hyung-Ja de Zeeuw

Senior Strategist
Corporates
+31 30 712 1555
Hyung-Ja.de.Zeeuw@Rabobank.com

Bas van Zanden

Senior Analyst
Pension funds, Regulation
+31 30 712 1869
Bas.van.Zanden@Rabobank.com

Cas Bonsema

Analyst
ABS
+31 30 712 1849
Cas.Bonsema@Rabobank.com

Energy & Metals

Ryan Fitzmaurice

Strategist
+1 212 916 7874
Ryan.Fitzmaurice@Rabobank.com

Agri Commodity Markets

Stefan Vogel

Head of ACRM
+44 20 7664 9523
Stefan.Vogel@Rabobank.com

Carlos Mera

Senior Commodity Analyst
+44 20 7664 9512
Carlos.Mera@Rabobank.nl

Michael Magdovitz

Commodity Analyst
+44 20 7664 9969
Michael.Magdovitz@Rabobank.com

Client coverage

Wholesale Corporate Clients

Martijn Sorber	Global Head	+31 30 712 3578	Martijn.Sorber@Rabobank.com
Hans Deusing	Netherlands	+31 30 216 9045	Hans.Deusing@Rabobank.com
David Kane	Europe	+44 20 7664 9744	David.Kane@Rabobank.com
Neil Williamson	North America	+1 212 808 6966	Neil.Williamson@Rabobank.com
David Teakle	Australia, New Zealand	+61 2 8115 3101	David.Teakle@Rabobank.com
Ethan Sheng	Asia	+852 2103 2688	Ethan.Sheng@Rabobank.com
Ricardo Rosa	Brazil	+55 11 5503 7150	Ricardo.Rosa@Rabobank.com

Financial Institutions

Youssef El Mir	Short Term Interest Rates	+31 30 216 9454	Youssef.El.Mir@Rabobank.com
Henk Rozendaal	Interest Rate Derivatives	+31 30 216 9423	Henk.Rozendaal@Rabobank.com
Huib Verbeek	Bonds	+31 30 216 9612	Huib.Verbeek@Rabobank.com
Martijn Sorber	Solutions	+31 30 712 3578	Martijn.Sorber@Rabobank.com

Capital Markets

Herald Top	Global Head of Capital Markets	+31 30 216 9501	Herald.Top@Rabobank.com
Christopher Hartofilis	Capital Markets USA	+1 212 808 6890	Christopher.Hartofilis@Rabobank.com
Ian Baggott	Capital Markets Asia	+852 2103 2629	Ian.Baggott@Rabobank.com
Willem Kröner	Global Head of Equity Capital Markets	+31 30 712 4783	Willem.Kroner@Rabobank.com
Harman Dhami	DCM Syndicate	+44 20 7664 9738	Harman.Dhami@Rabobank.com
Crispijn Kooijmans	DCM Fls & SSAs	+31 30 216 9028	Crispijn.Kooijmans@Rabobank.com
Bjorn Alink	DCM Securitisation & Covered Bonds	+31 30 216 9393	Bjorn.Alink@Rabobank.com
Othmar ter Waarbeek	DCM Corporate Bonds	+31 30 216 9022	Othmar.ter.Waarbeek@Rabobank.com
Joris Reijnders	DCM Corporate Loans	+31 30 216 9510	Joris.Reijnders@Rabobank.com
Brian Percival	DCM Leveraged Finance	+44 20 7809 3156	Brian.Percival@Rabobank.com

Disclaimer

Non Independent Research

This document is issued by Coöperatieve Rabobank U.A. incorporated in the Netherlands, trading as Rabobank (Rabobank) a cooperative with excluded liability. The liability of its members is limited. Rabobank is authorised by De Nederlandsche Bank (DNB) and the Netherlands Authority for the Financial Markets (AFM). Rabobank London Branch (RL) is authorised by the Prudential Regulation Authority (PRA) and subject to limited regulation by the Financial Conduct Authority (FCA) and PRA. Details about the extent of our authorisation and regulation by the PRA, and regulation by the FCA are available from us on request. RL is registered in England and Wales under Company no. FC 11780 and under Branch No. BR002630. This document is directed exclusively to Eligible Counterparties and Professional Clients. It is not directed at Retail Clients.

This document does not purport to be impartial research and has not been prepared in accordance with legal requirements designed to promote the independence of Investment Research and is not subject to any prohibition on dealing ahead of the dissemination of Investment Research. This document does NOT purport to be an impartial assessment of the value or prospects of its subject matter and it must not be relied upon by any recipient as an impartial assessment of the value or prospects of its subject matter. No reliance may be placed by a recipient on any representations or statements made outside this document (oral or written) by any person which state or imply (or may be reasonably viewed as stating or implying) any such impartiality.

This document is for information purposes only and is not, and should not be construed as, an offer or a commitment by RL or any of its affiliates to enter into a transaction. This document does not constitute investment advice and nor is any information provided intended to offer sufficient information such that is should be relied upon for the purposes of making a decision in relation to whether to acquire any financial products. The information and opinions contained in this document have been compiled or arrived at from sources believed to be reliable, but no representation or warranty, express or implied, is made as to their accuracy, completeness or correctness.

The information contained in this document is not to be relied upon by the recipient as authoritative or taken in substitution for the exercise of judgement by any recipient. Any opinions, forecasts or estimates herein constitute a judgement of RL as at the date of this document, and there can be no assurance that future results or events will be consistent with any such opinions, forecasts or estimates. All opinions expressed in this document are subject to change without notice.

To the extent permitted by law, neither RL, nor other legal entities in the group to which it belongs accept any liability whatsoever for any direct or consequential loss howsoever arising from any use of this document or its contents or otherwise arising in connection therewith.

Insofar as permitted by applicable laws and regulations, RL or other legal entities in the group to which it belongs, their directors, officers and/or employees may have had or have a long or short position or act as a market maker and may have traded or acted as principal in the securities described within this document (or related investments) or may otherwise have conflicting interests. This may include hedging transactions carried out by RL or other legal entities in the group, and such hedging transactions may affect the value and/or liquidity of the securities described in this document. Further it may have or have had a relationship with or may provide or have provided corporate finance or other services to companies whose securities (or related investments) are described in this document. Further, internal and external publications may have been issued prior to this publication where strategies may conflict according to market conditions at the time of each publication.

This document may not be reproduced, distributed or published, in whole or in part, for any purpose, except with the prior written consent of RL. By accepting this document you agree to be bound by the foregoing restrictions. The distribution of this document in other jurisdictions may be restricted by law and recipients of this document should inform themselves about, and observe any such restrictions.

Please email fm.global.unsubscribe@rabobank.com to be removed from this mailing list

A summary of the methodology can be found on our website www.rabobank.com

© Rabobank London, Thames Court, One Queenhithe, London EC4V 3RL +44(0) 207 809 3000