China's infrastructure plan likely to raise government's contingent liabilities

by Edoardo Campanella, Economist (UniCredit Bank, Milan)

- At its December meeting, China's Central Economic Work Conference promised to boost infrastructure spending to counter the growth slowdown.
- While China's infrastructure investment is high for its level of development, there is room to undertake new projects and upgrade existing physical assets.
- Any such plan poses two challenges. First, the Chinese government will likely rely on SOEs to deliver it, with a risk of misallocating resources and undertaking projects with a low marginal return.
- Second, despite a financial innovation like special purpose bonds (which do not imply a government guarantee) to fund these projects, Beijing risks to see a rise in its contingent liabilities.
- As a matter of fact, the market for this kind of bonds is still underdeveloped. This raises the odds that either Chinese banks, which are de facto controlled by Beijing, are pushed to buy them, or that provinces resort to off-budget financing tools, which are implicitly backed by the state.
- In both cases, China's augmented public debt risks being lifted towards 80% of GDP.

China's economy continues to cool. In 2018, annual GDP growth decelerated to 6.6% – the slowest pace since 1990. Furthermore, the latest string of indicators this year, from the manufacturing PMI and industrial profits to trade figures, has surprised to the downside, confirming the loss of momentum. The structural growth slowdown, which is the result of an ageing population, a shrinking workforce and the middle-income trap, is probably arriving faster than the party leadership expected. And the trade skirmish with Washington is simply reinforcing these dynamics.

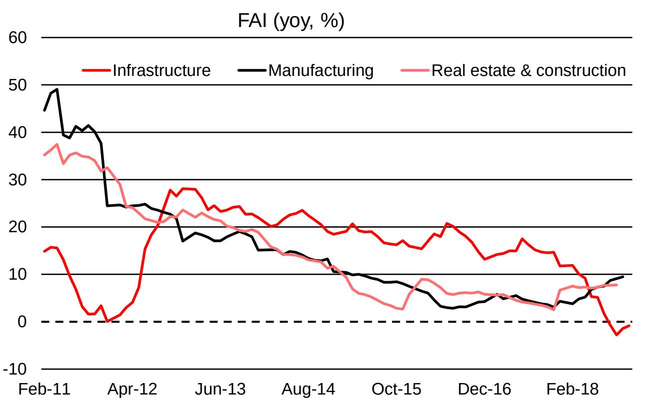
Beijing is now trying to arrest the slowdown by resorting to its traditional engine of growth, investment. In late November the State Council asked local governments and authorities to invest in the construction of roads and waterways, while expanding its railway freight capacity in order to ease traffic congestion and pollution.[1] More than USD 120bn of rail projects across the country, the equivalent of 1% of GDP, were approved in December only, which would add 6,800km of track in 2019. Moreover, in December the Central Economic Work Conference, which maps out financial and economic goals for the coming year, promised "rather large" (but unspecified) increases in bond sales to fund infrastructure projects (like subways, roads and railways), along with tax reductions.

Markets initially interpreted the vague wording as a signal that Beijing was unlikely to adopt a massive stimulus to deliver a strong rebound in growth and it would rather opt for small incremental steps to arrest the slowdown, using tax cuts as the first line of defense. However, the growing signs of weakness might force Beijing to adopt a more ambitious strategy than in 2018 – probably similar to the stimulus adopted in 2009, when the focus was primarily on high-speed railways. While it is possible to make an economic case for a further expansion of China's infrastructure stock, any such plan poses two challenges. First, China will likely rely on SOEs to deliver it, with a risk of further misallocating resources and undertaking projects with a low return. Second, despite a financial innovation like special purpose bonds, Beijing risks to see a significant rise in its contingent liabilities, and so in its augmented public debt.

A change of policy course from 2018

In early 2018, Beijing largely reduced its support to the economy, letting growth in fixed-asset investment (FAI) drop to roughly 5% (the lowest level since the current version of the FAI started to be recorded), with state investment remaining stagnant for several months (Chart 1). After his reelection as leader of the country, Mr. Xi wanted to reduce the credit stimulus in order to address the financial risks stemming from rising corporate debt, particularly SOEs'. Almost all of the slowdown in FAI came from weakness in infrastructure spending, which intensified last spring, when it was imposed a crackdown on local government borrowing.

CHART 1: FALLING INVESTMENT IN INFRASTRUCTURE THE MAIN DRIVER OF THE SLOWDOWN



Source: CBS, UniCredit Research

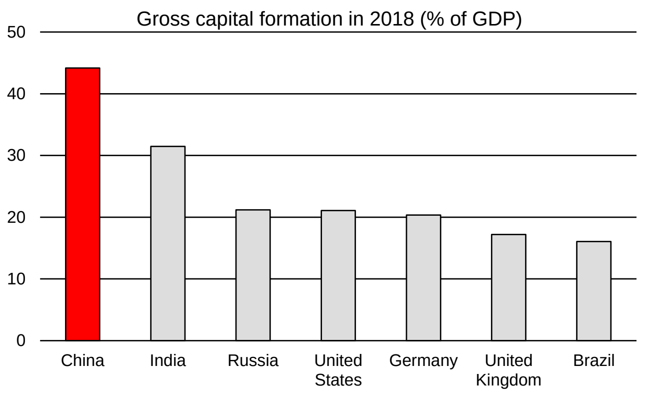
[1] Reuters, "China spends $328 billion on transport infrastructure from January to September: ministry", 26 Oct 2018

However, the deterioration in the global outlook in 2H18, which was largely driven by the trade war with the US, forced China to change policy course. With exports slowing down amid Washington's import tariffs, Beijing reactivated the investment growth engine. In July, the Communist party's politburo – its top policymaking body – called for a boost to infrastructure spending and at its October meeting it omitted any mention of "deleveraging". At the end of 2018, as shown by the leg up in chart 1, there were already tentative signs of a bottoming out in the growth of infrastructure investment.

The economic case for more infrastructure spending

With overinvestment being one of China's major macroeconomic challenges, an investment stimulus, even if centered around new infrastructure and not new factories or real estate assets, does not sound as the wisest policy path to undertake (chart 2). At 45% China's investment-to-GDP ratio is almost twice as high as in the main advanced and emerging economies.

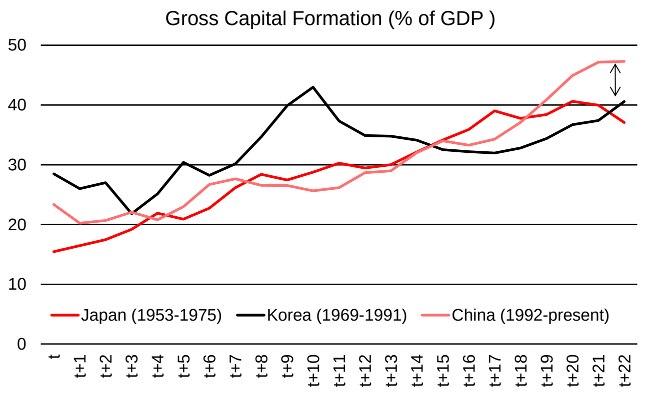
CHART 2. AN OVERINVESTMENT PROBLEM



Source: IMF, UniCredit Research

In just ten years, the investment ratio has surged from about 30% to 45% of GDP, which is significantly higher even compared to the experience of Japan and Korea – two economies that followed similar investment-led, export-oriented growth models (Chart 3). What is interesting is that, while until a decade ago the ratio was in line with that recorded by Korea and Japan during their high-development phases, its pace of growth in China in recent years has outstripped that of the other two countries.

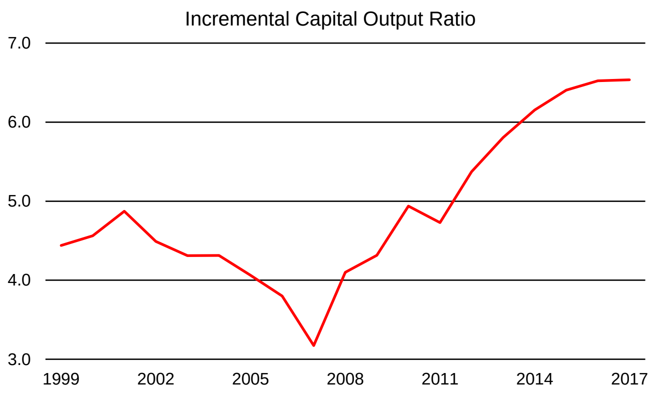
CHART 3: A GROWTH MODEL GONE TOO FAR



Source: Penn Table, UniCredit Research

Signs of overinvestment can be seen from a credit perspective. The investment elasticity to money – i.e. the way investment reacts to an expansion in the M2 monetary base – has been declining for quite some time and it has now reached historical lows (below 1 from a peak of 2.5 in 2005). Therefore, even if monetary conditions continue to improve, the pass-through to investment might be limited,. Equally, the incremental capital-output ratio, which is a useful estimate of the productivity of capital, more than doubled between 2008 and 2017 – meaning that less and less productive capital has been added to the stock in recent years (chart 4).[2]

CHART 4: FALLING INVESTMENT EFFICIENCY



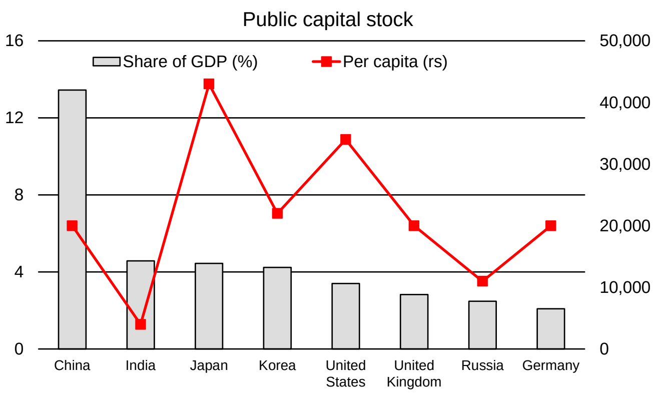
Source: CBS, UniCredit Research

However, high investment ratios do not necessarily imply lack of scope for more spending on infrastructure. By international standards, China is certainly investing much more in infrastructure than most of its peers, both developing and advanced economies.

[2] The incremental capital output ratio (ICOR) explains the relationship between the level of investment made in the economy and the consequent increase in GDP. ICOR indicates the additional unit of capital or investment needed to produce an additional unit of output. See IMF Working Papers, "Rebalancing in China—Progress and Prospects"

The IMF estimates that the Chinese public capital stock (Chart 5), comprising economic and social infrastructure, was 13.4% of GDP in 2015, compared with an average of just 3.2% in the other BRICS countries. However, in per capita terms, it stood at just under USD 20,000, similar to the level recorded in advanced economies (China's true benchmarks in the coming years) such as the UK and Germany, but far below countries like the US or Japan.

CHART 5: STILL SOME ROOM FOR EXPANSION



Source: IMF, UniCredit Research

Therefore, despite China's infrastructure investment being very high relative to the country's level of development (as implied by the size of its GDP), in the future there will still be need for more infrastructure and for the upgrade of existing physical assets to match those of its direct rivals in the global arena (as implied by the size of a country's population). China is still urbanizing and more infrastructure will be necessary to absorb migrants from the countryside. Moreover, most international sources recognize that the country's infrastructure development remains sub-par. China ranked 47th overall in the World Economic Forum's 2017 Quality of Infrastructure Ranking, scoring poorly in all subsectors other than railways.

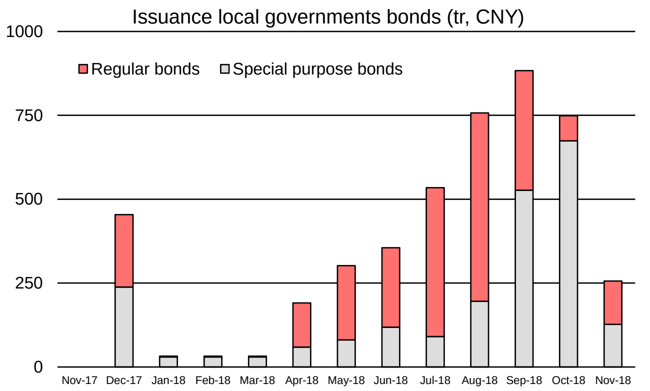
There are two elements of concern, though. First, most projects will likely be taken on by state-owned-enterprises as they are considered by the government as the most reliable agents to deliver this sort of stimulus. But SOEs tend to misallocate resources and might risk ending up undertaking projects with a low return. A number of studies have shown that SOEs, which have substantially contributed to the rise in China's corporate debt, tend to crowd out private investment, contribute to lower productivity growth, and hinder competition.[3] As a result the cost of opting for these companies will be implicitly borne by small and medium-sized enterprises, which are more dynamic and have better growth prospects than those under state control.

For instance, in 2015 industrial SOEs generated a return on assets of 2.9% compared with 10.3% for private industrial enterprises. The second issue has to do with a likely rise in contingent liabilities for the central government to fund these projects, despite many attempts to avoid it.[4]

Rising contingent liabilities

When in the summer 2018 Beijing decided to reactivate the investment engine, it instructed local governments to accelerate the issuance of special-purpose bonds with proceeds earmarked for specific infrastructure projects and that could not be used for general expenditure (Chart 6). Special purpose bonds differ from traditional local government bonds in that they are repaid by returns on projects instead of by the government. The issuance of special-purpose bonds peaked in October and then declined sharply in November. As discussed, China's goal was probably to attenuate the negative spillovers from the underlying GDP slowdown without delivering a strong growth rebound.

CHART 6: FUNDING NEW INFRASTRUCTURE



Source: Bloomberg, UniCredit Research

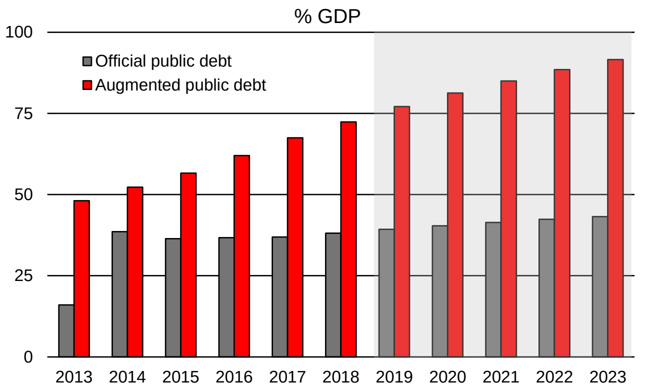
In particular, Beijing wanted special-purpose bonds to reduce the reliance on off-budget borrowing through local government financing vehicles (LGFVs), whose debt servicing responsibilities are shared by the central government, either directly or indirectly. Most local governments have to resort to LGFVs because they face structural revenue shortfalls relative to their spending needs for two reasons. The intergovernmental transfer system relies on revenue-sharing and tax rebate transfers, which put pressure on provinces with low tax capacity. And repayment abilities of many local governments are weakened by slower fiscal revenue growth and smaller land sales incomes amid an economic slowdown.

[3] See, W. Raphael Lam, Alfred Schipke, Yuyan Tan, and Zhibo Tan, "Resolving China's Zombies: Tackling Debt and Raising Productivity", IMF Working Paper 17/266

[4] In general, China is the most decentralized country in the world in terms of expenditure shares, with subnational governments responsible for 85 percent of government spending.

In the recent past, LGFVs have contributed to increasing China's contingent liabilities. The IMF, in its latest Article IV Consultation, highlighted that while the official public debt figure in China in 2018 was around 40% of GDP, the augmented debt (which takes into account LGFVs) was about 75% (Chart 7). And infrastructure spending accounts for roughly two-thirds of the gap between the two measures of public debt.

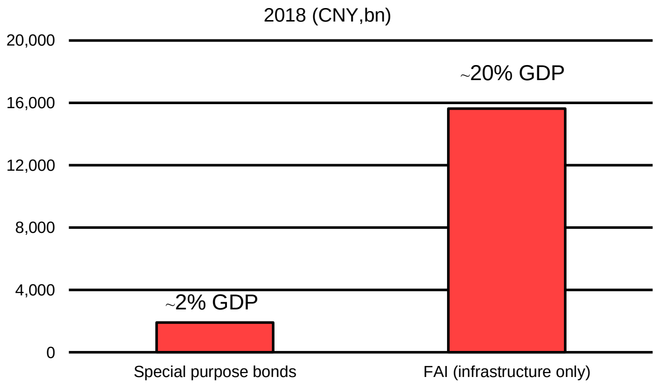
CHART 7: RISING DEBT TRAJECTORY, ALTHOUGH STILL MANAGEABLE



Source: IMF, UniCredit Research

The truth is that the market for local government bonds is still underdeveloped as a result of low liquidity, weak credit discipline and structural fiscal deficits of provinces. Special purpose bonds, in particular, create even greater challenges. Local infrastructure projects, some of which are potentially loss-making, often take years to generate investment returns, raising the risk of default as it is poorly collateralised and project cash flow estimates are often overstated. Not surprisingly, as shown by Chart 8, in 2018 special-purpose bonds covered less than 15% of the funding needs of local governments to pay for physical infrastructure. If the past is of any guide, local governments might end up paying for new roads and railways by resorting to LGFVs. If so, Beijing will be forced to reluctantly take on these liabilities.

CHART 8: A WIDE GAP BETWEEN SPECIAL-PURPOSE BONDS AND FAI



Source: CNS, UniCredit Research

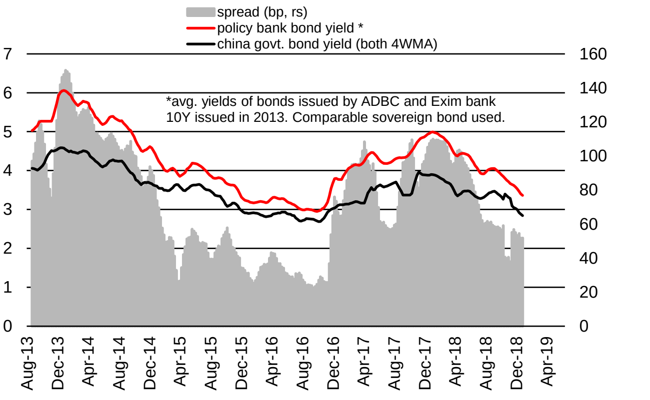
Therefore, Beijing might be forced to intervene and guarantee this debt to avoid serial defaults.[5] Or, as it did last summer, it will pass on the burden to commercial banks (which are de facto controlled by the government). After Beijing's instructions to local governments last July to accelerate issuance, regulators followed up with policy tweaks designed to support such sales. These included eliminating a 20% limit on the share of any local government bond sale that bank underwriters could purchase for their own balance sheets. Also, and according to media reports that should be taken with a pinch of salt, since these bonds have low yields and are not very liquid, local governments have exerted political pressure to ensure robust demand from banks.[6]

For now, markets remain unconcerned. Specifically, the yields on bonds issued by policy banks – the state-owned banks that help implement economic policies of the government – have been declining alongside government bond yields (chart 9). Moreover, the spread of such bonds have been tightening vis-à-vis the sovereign. This implies two takeaways. First, the policy banks are facing no pressing issue at present in securing funding, which, in turn, could be used to purchases the bonds issued by local governments. Second, the rally in sovereign bonds suggests that markets are focusing more on weaker growth and inflation, rather than any potential fiscal risks in the longer term.

[5] S&P Global, "China's hidden subnational debt suggest more LGFV defaults are likely", 15 October 2018

[6] https://www.ft.com/content/8e3e2dae-ba58-11e8-94b2-17176fbf93f5

CHART 9: BONDS ISSUED BY CHINESE POLICY BANKS HAVE BEEN WELL BID AMID THE SOVEREIGN BOND RALLY



Source: Bloomberg, UniCredit Research

Conclusion

Beijing seems torn between resorting to its old ways by boosting investment and changing policy course. The short-term benefits of the investment plan in terms of growth might not offset the long-term cost stemming from possible resource misallocation and growing financial risks. SOEs might end up undertaking projects with a low marginal return, while it seems premature to rely on a financial instrument like special purpose bonds whose market is still underdeveloped. The risk is to force local authorities to resort to LGFVs in order to meet the growth targets set by the central government or, if special purpose bonds are actually issued, commercial banks, which are de facto controlled by the government, might be forced to purchase them as it happened last summer. In both cases, China's augmented public debt would trend higher.

Author

Edoardo Campanella
Economist
(UniCredit Bank, Milan)
+39 02 8862-0522
edoardo.campanella@unicredit.eu

Editor

Marco Valli
Head of Macro Research,
Chief European Economist
(UniCredit Bank, Milan)
+39 02 8862-0537
marco.valli@unicredit.eu

Previous editions of Economics Thinking

» Dissecting the slowdown in eurozone exports - 17 January 2019
» Italy: Budget should have done more to address weak capital accumulation and sluggish potential growth - 14 December 2018
» Sweden: High household indebtedness complicates the Riksbank´s interest rate normalization - 23 October 2018
» The drivers of EM capital flows - 28 September 2018
» European venture capital: unleashing potential - 11 September 2018
» What if? Trade wars and global supply chains - 7 September 2018
» US: Is the wealth effect dead? - 30 August 2018
» CNY-denominated commodities won't fly without CNY convertibility - 27 July 2018
» Eurozone firms are more resilient to a tightening of financial conditions - 19 July 2018
» Progress in integrating refugees on German labor market - 9 July 2018
» French corporate debt: taking advantage of cheap financing - 15 June 2018
» A turning point in the global economy? - 8 June 2018
» The problems with the Swiss Sovereign Money Initiative - 5 June 2018
» The productivity puzzle: the Digital Revolution has yet to come - 11 May 2018
» How the US-Eurozone growth differential gets revised away - 27 April 2018
» US tariffs: estimating the cost to European industry - 26 April 2018
» Italy: potential growth on the rise, but could be boosted further - 6 April 2018
» US-China trade threats: a dangerous game - 22 March 2018
» Germany: Comeback of the Phillips curve - 26 February 2018
» US small businesses: Sentiment vs. Activity - 13 February 2018
» Greece: the exit looks near - 2 February 2018
» The oil rally is about to run out of steam - 26 January 2018
» Eurozone consumers: bullish, but reluctant to dissave - 18 January 2018
» Why the Fed will not switch to price-level targeting - 11 January 2018
» No, Virginia, the US is not a 3% growth economy - 12 December 2017
» Eurozone investment is set to stage a comeback - 10 November 2017
» French labor market reform to boost productivity - 26 October 2017
» A stronger euro: implications for EMU growth and why we do not worry - 20 October 2017
» The Wage Phillips Curve: Has it moved? - 13 October 2017
» Corporate tax cuts will benefit shareholders not economic growth - 26 September 2017
» Demystifying the decline in US core inflation - 26 July 2017
» Why we expect oil prices at USD 50/bbl to be an equilibrium - 21 July 2017
» Cryptocurrencies: They aren´t money but the technology is here to stay - 7 July 2017
» Why the ECB is right on sequencing - 30 June 2017
» The US unemployment rate will hit a five-decade low before long - 20 June 2017
» ECB in 2018: caught between tame inflation and technical constraints - 14 June 2017
» UK election: An economist's guide to the manifestos - 8 June 2017
» Greece: the time for recognition has not yet come - 31 May 2017
» Capital flows to EM: a revival or a dead-cat bounce? - 19 May 2017
» Russian vs Turkish monetary policy: the good and the bad - 5 May 2017
» Is China inflating away its corporate debt? - 28 April 2017
» Central Europe: markets overestimating upcoming monetary tightening - 21 April 2017
» Eurozone: weak core inflation and wages reflect substantial slack - 6 April 2017

Legal Notices

Glossary

A comprehensive glossary for many of the terms used in the report is available on our website: link

Disclaimer

Our recommendations are based on information obtained from, or are based upon public information sources that we consider to be reliable but for the completeness and accuracy of which we assume no liability. All estimates and opinions and projections and forecasts included in the report represent the independent judgment of the analysts as of the date of the issue unless stated otherwise. This report may contain links to websites of third parties, the content of which is not controlled by UniCredit Bank. No liability is assumed for the content of these third-party websites. We reserve the right to modify the views expressed herein at any time without notice. Moreover, we reserve the right not to update this information or to discontinue it altogether without notice. This analysis is for information purposes only and (i) does not constitute or form part of any offer for sale or subscription of or solicitation of any offer to buy or subscribe for any financial, money market or investment instrument or any security, (ii) is neither intended as such an offer for sale or subscription of or solicitation of an offer to buy or subscribe for any financial, money market or investment instrument or any security nor (iii) as an advertisement thereof. The investment possibilities discussed in this report may not be suitable for certain investors depending on their specific investment objectives and time horizon or in the context of their overall financial situation. The investments discussed may fluctuate in price or value. Investors may get back less than they invested. Changes in rates of exchange may have an adverse effect on the value of investments. Furthermore, past performance is not necessarily indicative of future results. In particular, the risks associated with an investment in the financial, money market or investment instrument or security under discussion are not explained in their entirety.
This information is given without any warranty on an "as is" basis and should not be regarded as a substitute for obtaining individual advice. Investors must make their own determination of the appropriateness of an investment in any instruments referred to herein based on the merits and risks involved, their own investment strategy and their legal, fiscal and financial position. As this document does not qualify as an investment recommendation or as a direct investment recommendation, neither this document nor any part of it shall form the basis of, or be relied on in connection with or act as an inducement to enter into, any contract or commitment whatsoever. Investors are urged to contact their bank's investment advisor for individual explanations and advice.

Neither UniCredit Bank AG, UniCredit Bank AG London Branch, UniCredit Bank AG Milan Branch, UniCredit Bank AG Vienna Branch, UniCredit Bank Austria AG, UniCredit Bulbank, Zagrebačka banka d.d., UniCredit Bank Czech Republic and Slovakia, ZAO UniCredit Bank Russia, UniCredit Bank Czech Republic and Slovakia Slovakia Branch, UniCredit Bank Romania, UniCredit Bank AG New York Branch nor any of their respective directors, officers or employees nor any other person accepts any liability whatsoever (in negligence or otherwise) for any loss howsoever arising from any use of this document or its contents or otherwise arising in connection therewith.

This analysis is being distributed by electronic and ordinary mail to investors, who are expected to make their own investment decisions without undue reliance on this publication, and may not be redistributed, reproduced or published in whole or in part for any purpose.

Responsibility for the content of this publication lies with:
UniCredit Group and its subsidiaries are subject to regulation by the European Central Bank

a) UniCredit Bank AG (UniCredit Bank, Munich or Frankfurt), Arabellastraße 12, 81925 Munich, Germany, (also responsible for the distribution pursuant to §34b WpHG). The company belongs to UniCredit Group.
Regulatory authority: "BaFin" – Bundesanstalt für Finanzdienstleistungsaufsicht, Marie-Curie-Str. 24-28 , 60439 Frankfurt, Germany.

b) UniCredit Bank AG London Branch (UniCredit Bank, London), Moor House, 120 London Wall, London EC2Y 5ET, United Kingdom.
Regulatory authority: "BaFin" – Bundesanstalt für Finanzdienstleistungsaufsicht, Marie-Curie-Str. 24-28, 60439 Frankfurt, Germany and subject to limited regulation by the Financial Conduct Authority, 12 Endeavour Square, London E20 1JN, United Kingdom and Prudential Regulation Authority 20 Moorgate, London, EC2R 6DA, United Kingdom. Further details regarding our regulatory status are available on request.
c) UniCredit Bank AG Milan Branch (UniCredit Bank, Milan), Piazza Gae Aulenti, 4 - Torre C, 20154 Milan, Italy, duly authorized by the Bank of Italy to provide investment services.
Regulatory authority: "Bank of Italy", Via Nazionale 91, 00184 Roma, Italy and Bundesanstalt für Finanzdienstleistungsaufsicht, Marie-Curie-Str. 24-28, 60439 Frankfurt, Germany.
d) UniCredit Bank AG Vienna Branch (UniCredit Bank, Vienna), Rothschildplatz 1, 1020 Vienna, Austria
Regulatory authority: Finanzmarktaufsichtsbehörde (FMA), Otto-Wagner-Platz 5, 1090 Vienna, Austria and subject to limited regulation by the "BaFin" – Bundesanstalt für Finanzdienstleistungsaufsicht, Marie-Curie-Str. 24-28, 60439 Frankfurt, Germany. Details about the extent of our regulation by the Bundesanstalt für Finanzdienstleistungs-aufsicht are available from us on request.
e) UniCredit Bank Austria AG (Bank Austria), Rothschildplatz 1, 1020 Vienna, Austria
Regulatory authority: Finanzmarktaufsichtsbehörde (FMA), Otto-Wagner-Platz 5, 1090 Vienna, Austria
f) UniCredit Bulbank, Sveta Nedelya Sq. 7, BG-1000 Sofia, Bulgaria
Regulatory authority: Financial Supervision Commission (FSC), 16 Budapeshta str., 1000 Sofia, Bulgaria
g) Zagrebačka banka d.d., Trg bana Josipa Jelačića 10, HR-10000 Zagreb, Croatia
Regulatory authority: Croatian Agency for Supervision of Financial Services, Franje Račkoga 6, 10000 Zagreb, Croatia
h) UniCredit Bank Czech Republic and Slovakia, Želetavská 1525/1, 140 92 Praga 4, Czech Republic
Regulatory authority: CNB Czech National Bank, Na Příkopě 28, 115 03 Praga 1, Czech Republic
i) ZAO UniCredit Bank Russia (UniCredit Russia), Prechistenskaya nab. 9, RF-119034 Moscow, Russia
Regulatory authority: Federal Service on Financial Markets, 9 Leninsky prospekt, Moscow 119991, Russia
j) UniCredit Bank Czech Republic and Slovakia, Slovakia Branch, Šancova 1/A, SK-813 33 Bratislava, Slovakia
Regulatory authority: CNB Czech National Bank, Na Příkopě 28, 115 03 Praha 1, Czech Republic and subject to limited regulation by the National Bank of Slovakia, Imricha Karvaša 1, 813 25 Bratislava, Slovakia. Regulatory authority: National Bank of Slovakia, Imricha Karvaša 1, 813 25 Bratislava, Slovakia
k) UniCredit Bank Romania, Bucharest 1F Expozitiei Boulevard, 012101 Bucharest 1, Romania
Regulatory authority: National Bank of Romania, 25 Lipscani Street, 030031, 3rd District, Bucharest, Romania
l) UniCredit Bank AG New York Branch (UniCredit Bank, New York), 150 East 42nd Street, New York, NY 10017
Regulatory authority: "BaFin" – Bundesanstalt für Finanzdienstleistungsaufsicht, Marie-Curie-Str. 24-28, 60439 Frankfurt, Germany and New York State Department of Financial Services, One State Street, New York, NY 10004-1511

POTENTIAL CONFLICTS OF INTEREST

UniCredit S.p.A. acts as a Specialist or a Primary Dealer in government bonds issued by the Italian or Greek Treasury, and as market maker in government bonds issued by the Spain or Portuguese Treasury. Main tasks of the Specialist are to participate with continuity and efficiency to the governments' securities auctions, to contribute to the efficiency of the secondary market through market making activity and quoting requirements and to contribute to the management of public debt and to the debt issuance policy choices, also through advisory and UniCredit Bank AG research activities. UniCredit S.p.A. Registered Office in Rome: Via Alessandro Specchi, 16 - 00186 Roma Head Office in Milan: Piazza Gae Aulenti 3 - Tower A - 20154 Milano, Registered in the Register of Banking Groups and Parent Company of the UniCredit Banking Group, with. cod. 02008.1; Cod. ABI 02008.1 - Competent Authority: Commissione Nazionale per le Società e la Borsa (CONSOB)".
UniCredit Bank AG acts as a Specialist or Primary Dealer in government bonds issued by the German or Austrian Treasury. Main tasks of the Specialist are to participate with continuity and efficiency to the governments' securities auctions, to contribute to the efficiency of the secondary market through market making activity and quoting requirements and to contribute to the management of public debt and to the debt issuance policy choices, also through advisory and research activities.

ANALYST DECLARATION

The author's remuneration has not been, and will not be, geared to the recommendations or views expressed in this study, neither directly nor indirectly.

ORGANIZATIONAL AND ADMINISTRATIVE ARRANGEMENTS TO AVOID AND PREVENT CONFLICTS OF INTEREST

To prevent or remedy conflicts of interest, UniCredit Bank AG, UniCredit Bank AG London Branch, UniCredit Bank AG Milan Branch, UniCredit Bank AG Vienna Branch, UniCredit Bank Austria AG, UniCredit Bulbank, Zagrebačka banka d.d., UniCredit Bank Czech Republic and Slovakia, ZAO UniCredit Bank Russia, UniCredit Bank Czech Republic and Slovakia Slovakia Branch, UniCredit Bank Romania, UniCredit Bank AG New York Branch have established the organizational arrangements required from a legal and supervisory aspect, adherence to which is monitored by its compliance department. Conflicts of interest arising are managed by legal and physical and non-physical barriers (collectively referred to as "Chinese Walls") designed to restrict the flow of information between one area/department of UniCredit Bank AG, UniCredit Bank AG London Branch, UniCredit Bank AG Milan Branch, UniCredit Bank AG Vienna Branch, UniCredit Bank Austria AG, UniCredit Bulbank, Zagrebačka banka d.d., UniCredit Bank Czech Republic

and Slovakia, ZAO UniCredit Bank Russia, UniCredit Bank Czech Republic and Slovakia Slovakia Branch, UniCredit Bank Romania, UniCredit Bank AG New York Branch, and another. In particular, Investment Banking units, including corporate finance, capital market activities, financial advisory and other capital raising activities, are segregated by physical and non-physical boundaries from Markets Units, as well as the research department. In the case of equities execution by UniCredit Bank AG Milan Branch, other than as a matter of client facilitation or delta hedging of OTC and listed derivative positions, there is no proprietary trading.
Disclosure of publicly available conflicts of interest and other material interests is made in the research. Analysts are supervised and managed on a day-to-day basis by line managers who do not have responsibility for Investment Banking activities, including corporate finance activities, or other activities other than the sale of securities to clients.

ADDITIONAL REQUIRED DISCLOSURES UNDER THE LAWS AND REGULATIONS OF JURISDICTIONS INDICATED

You will find a list of further additional required disclosures under the laws and regulations of the jurisdictions indicated on our website
http://www.cib-unicredit.com/research-disclaimer.

Notice to Austrian investors: This publication is only for distribution to professional clients as defined in article 66 WAG (2018).

Notice to investors in Bosnia and Herzegovina: This report is intended only for clients of UniCredit in Bosnia and Herzegovina who are institutional investors (Institucionalni investitori) in accordance with Article 2 of the Law on Securities Market of the Federation of Bosnia and Herzegovina and Article 2 of the Law on Securities Markets of the Republic of Srpska, respectively, and may not be used by or distributed to any other person. This document does not constitute or form part of any offer for sale or subscription for or solicitation of any offer to buy or subscribe for any securities and neither this document nor any part of it shall form the basis of, or be relied on in connection with or act as an inducement to enter into, any contract or commitment whatsoever.

Notice to Brazilian investors: The individual analyst(s) responsible for issuing this report represent(s) that: (a) the recommendations herein reflect exclusively the personal views of the analysts and have been prepared in an independent manner, including in relation to UniCredit Group; and (b) except for the potential conflicts of interest listed under the heading "Potential Conflicts of Interest" above, the analysts are not in a position that may impact on the impartiality of this report or that may constitute a conflict of interest, including but not limited to the following: (i) the analysts do not have a relationship of any nature with any person who works for any of the companies that are the object of this report; (ii) the analysts and their respective spouses or partners do not hold, either directly or indirectly, on their behalf or for the account of third parties, securities issued by any of the companies that are the object of this report; (iii) the analysts and their respective spouses or partners are not involved, directly or indirectly, in the acquisition, sale and/or trading in the market of the securities issued by any of the companies that are the object of this report; (iv) the analysts and their respective spouses or partners do not have any financial interest in the companies that are the object of this report; and (v) the compensation of the analysts is not, directly or indirectly, affected by UniCredit's revenues arising out of its businesses and financial transactions. UniCredit represents that: except for the potential conflicts of interest listed under the heading "Potential Conflicts of Interest" above, UniCredit, its controlled companies, controlling companies or companies under common control (the "UniCredit Group") are not in a condition that may impact on the impartiality of this report or that may constitute a conflict of interest, including but not limited to the following: (i) the UniCredit Group does not hold material equity interests in the companies that are the object of this report; (ii) the companies that are the object of this report do not hold material equity interests in the UniCredit Group; (iii) the UniCredit Group does not have material financial or commercial interests in the companies or the securities that are the object of this report; (iv) the UniCredit Group is not involved in the acquisition, sale and/or trading of the securities that are the object of this report; and (v) the UniCredit Group does not receive compensation for services rendered to the companies that are the object of this report or to any related parties of such companies.

Notice to Canadian investors: This communication has been prepared by UniCredit Bank AG, which does not have a registered business presence in Canada. This communication is a general discussion of the merits and risks of a security or securities only, and is not in any way meant to be tailored to the needs and circumstances of any recipient. The contents of this communication are for information purposes only, therefore should not be construed as advice and do not constitute an offer to sell, nor a solicitation to buy any securities.

Notice to Cyprus investors: This document is directed only at clients of UniCredit Bank who are persons falling within the Second Appendix (Section 2, Professional Clients) of the law for the Provision of Investment Services, the Exercise of Investment Activities, the Operation of Regulated Markets and other Related Matters, Law 144(I)/2007 and persons to whom it may otherwise lawfully be communicated who possess the experience, knowledge and expertise to make their own investment decisions and properly assess the risks that they incur (all such persons together being referred to as "relevant persons"). This document must not be acted on or relied on by persons who are not relevant persons or relevant persons who have requested to be treated as retail clients. Any investment or investment activity to which this communication related is available only to relevant persons and will be engaged in only with relevant persons. This document does not constitute an offer or solicitation to any person to whom it is unlawful to make such an offer or solicitation.

Notice to Hong Kong investors: This report is intended for Institutional Professional Investors as defined in paragraph (a) to (h) in Part 1 Schedule 1 of the Hong Kong Securities and Futures Ordinance ('SFO") and is distributed in Hong Kong by UniCredit Bank AG, Hong Kong branch which is a registered institution under the SFO. It may not be reproduced, or used by or further distributed to any other person, in whole or in part, for any purpose. This report does not constitute or form part of an offer or solicitation of any offer to buy or sell any securities, nor should it or any part of it form the basis of, or be relied upon in connection with, any contract or commitment whatsoever. By accepting this report, the recipient represents and warrants that it is entitled to receive such report in accordance with, and on the basis of, the restrictions set out in this "Disclaimer" section, and agrees to be bound by those restrictions.

Notice to investors in Ivory Coast: The information contained in the present report have been obtained by Unicredit Bank AG from sources believed to be reliable, however, no express or implied representation or warranty is made by Unicredit Bank AG or any other person as to the completeness or accuracy of such information. All opinions and estimates contained in the present report constitute a judgement of Unicredit Bank AG as of the date of the present report and are subject to change without notice. They are provided in good faith but without assuming legal responsibility. This report is not an offer to sell or solicitation of an offer to buy or invest in securities. Past performance is not an indicator of future performance and future returns cannot be guaranteed, and there is a risk of loss of the initial capital invested. No matter contained in this document may be reproduced or copied by any means without the prior consent of Unicredit Bank AG.

Notice to New Zealand investors: This report is intended for distribution only to persons who are "wholesale clients" within the meaning of the Financial Advisers Act 2008 ("FAA") and by receiving this report you represent and agree that (i) you are a "wholesale client" under the FAA (ii) you will not distribute this report to any other person, including (in particular) any person who is not a "wholesale client" under the FAA. This report does not constitute or form part of, in relation to any of the securities or products covered by this report, either (i) an offer of securities for subscription or sale under the Securities Act 1978 or (ii) an offer of financial products for issue or sale under the Financial Markets Conduct Act 2013.

Notice to Omani investors: This communication has been prepared by UniCredit Bank AG. UniCredit Bank AG does not have a registered business presence in Oman and does not undertake banking business or provide financial services in Oman and no advice in relation to, or subscription for, any securities, products or financial services may or will be consummated within Oman. The contents of this communication are for the information purposes of sophisticated clients, who are aware of the risks associated with investments in foreign securities and neither constitutes an offer of securities in Oman as contemplated by the Commercial Companies Law of Oman (Royal Decree 4/74) or the Capital Market Law of Oman (Royal Decree 80/98), nor does it constitute an offer to sell, or the solicitation of any offer to buy non-Omani securities in Oman as contemplated by Article 139 of the Executive Regulations to the Capital Market Law (issued vide CMA Decision 1/2009). This communication has not been approved by and UniCredit Bank AG is not regulated by either the Central Bank of Oman or Oman's Capital Market Authority.

Notice to Pakistani investors: Investment information, comments and recommendations stated herein are not within the scope of investment advisory activities as defined in sub-section I, Section 2 of the Securities and Exchange Ordinance, 1969 of Pakistan. Investment advisory services are provided in accordance with a contract of engagement on investment advisory services concluded with brokerage houses, portfolio management companies, non-deposit banks and the clients. The distribution of this report is intended only for informational purposes for the use of professional investors and the information and opinions contained herein, or any part of it shall not form the basis of, or be relied on in connection with or act as an inducement to enter into, any contract or commitment whatsoever.

Notice to Polish Investors: This document is intended solely for professional clients as defined in Art. 3.39b of the Trading in Financial Instruments Act of 29 July 2005 (as amended). The publisher and distributor of the document certifies that it has acted with due care and diligence in preparing it, however, assumes no liability for its completeness and accuracy. This document is not an advertisement. It should not be used in substitution for the exercise of independent judgment.

Notice to Serbian investors: This analysis is only for distribution to professional clients (profesionalni klijenti) as defined in article 172 of the Law on Capital Markets.

Notice to UK investors: This communication is directed only at clients of UniCredit Bank who (i) have professional experience in matters relating to investments or (ii) are persons falling within Article 49(2)(a) to (d) ("high net worth companies, unincorporated associations, etc.") of the United Kingdom Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 or (iii) to whom it may otherwise lawfully be communicated (all such persons together being referred to as "relevant persons"). This communication must not be acted on or relied on by persons who are not relevant persons. Any investment or investment activity to which this communication relates is available only to relevant persons and will be engaged in only with relevant persons.

ENP e 18/5

UniCredit Research* — Macro Research

Erik F. Nielsen
Group Chief Economist
Global Head of CIB Research
+44 207 826-1765
erik.nielsen@unicredit.eu

Dr. Ingo Heimig
Head of Research Operations
& Regulatory Controls
+49 89 378-13952
ingo.heimig@unicredit.de

Head of Macro Research

Marco Valli
Head of Macro Research
Chief European Economist
+39 02 8862-0537
marco.valli@unicredit.eu

European Economics Research

Dr. Andreas Rees
Chief German Economist
+49 69 2717-2074
andreas.rees@unicredit.de

Dr. Loredana Federico
Chief Italian Economist
+39 02 8862-0534
loredanamaria.federico@unicredit.eu

Stefan Bruckbauer
Chief Austrian Economist
+43 50505-41951
stefan.bruckbauer@unicreditgroup.at

Daniel Vernazza, Ph.D.
Chief UK & Senior Global Economist
+44 207 826-7805
daniel.vernazza@unicredit.eu

Tullia Bucco
Economist
+39 02 8862-0532
tullia.bucco@unicredit.eu

Edoardo Campanella
Economist
+39 02 8862-0522
edoardo.campanella@unicredit.eu

Walter Pudschedl
Economist
+43 50505-41957
walter.pudschedl@unicreditgroup.at

Chiara Silvestre
Economist
chiara.silvestre@unicredit.eu

Dr. Thomas Strobel
Economist
+49 89 378-13013
thomas.strobel@unicredit.de

US Economics Research

Dr. Harm Bandholz, CFA
Chief US Economist
+1 212 672-5957
harm.bandholz@unicredit.eu

EEMEA Economics Research

Dan Bucşa
Chief CEE Economist
+44 207 826-7954
dan.bucsa@unicredit.eu

Gökçe Çelik
Senior CEE Economist
+44 207 826-6077
gokce.celik@unicredit.eu

Mauro Giorgio Marrano
Senior CEE Economist
+43 50505-82712
mauro.giorgiomarrano@unicredit.de

Artem Arkhipov
Head, Macroeconomic Analysis
and Research, Russia
+7 495 258-7258
artem.arkhipov@unicredit.ru

Hrvoje Dolenec
Chief Economist, Croatia
+385 1 6006-678
hrvoje.dolenec@unicreditgroup.zaba.hr

Dr. Ágnes Halász
Chief Economist, Head of Economics and
Strategic Analysis, Hungary
+36 1 301-1907
agnes.halasz@unicreditgroup.hu

Ľubomír Koršňák
Chief Economist, Slovakia
+421 2 4950 2427
lubomir.korsnak@unicreditgroup.sk

Anca Maria Negrescu
Senior Economist, Romania
+40 21 200-1377
anca.negrescu@unicredit.ro

Kristofor Pavlov
Chief Economist, Bulgaria
+359 2 9269-390
kristofor.pavlov@unicreditgroup.bg

Pavel Sobíšek
Chief Economist, Czech Republic
+420 955 960-716
pavel.sobisek@unicreditgroup.cz

UniCredit Research, Corporate & Investment Banking, UniCredit Bank AG, Am Eisbach 4, D-80538 Munich, globalresearch@unicredit.de
Bloomberg: UCCR, Internet: www.research.unicredit.eu

MR 19/1

*UniCredit Research is the joint research department of UniCredit Bank AG (UniCredit Bank, Munich or Frankfurt), UniCredit Bank AG London Branch (UniCredit Bank, London), UniCredit Bank AG Milan Branch (UniCredit Bank, Milan), UniCredit Bank New York (UniCredit Bank, New York), UniCredit Bank AG Vienna Branch (UniCredit Bank, Vienna), UniCredit Bank Austria AG (Bank Austria), UniCredit Bulbank, Zagrebačka banka d.d., UniCredit Bank Czech Republic and Slovakia, ZAO UniCredit Bank Russia (UniCredit Russia), UniCredit Bank Romania.