

Real estate markets

Opportunities in Central and Eastern Europe

Chief Investment Office GWM | 03 April 2020 5:03 pm BST

Maciej Skoczek, CFA, CAIA, Economist, maciej.skoczek@ubs.com; Thomas Veraguth, Strategist, thomas.veraguth@ubs.com

- We expect CEE real estate to outperform continental European property investments slightly thanks to the ongoing catch-up of their economies. We expect investors to benefit from continuing yield compression.
- Relative strong economic growth prospects, higher levels of infrastructure spending than Western Europe, and the current lack of modern commercial surfaces will continue to drive total return in the real estate market over the coming years.
- The office, logistics/warehouse and residential market are, in our view, the most appealing segments. In contrast, retail spaces look less favorable.



Source: Istock

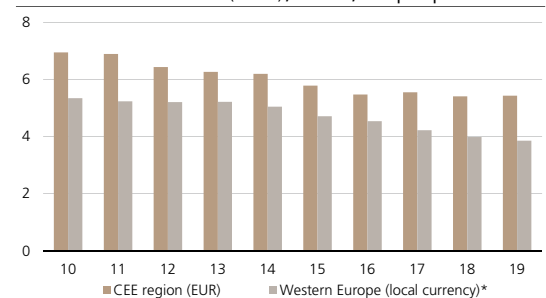
Central and Eastern European (CEE) real estate has been in high demand in recent years. According to Colliers, the money flows into this region increased from EUR 9 billion in 2015 to about EUR 13 billion in 2019. Polish properties attracted about 45% of total money inflows. Real estate investments in the Czech Republic accounted for 25% and in Hungary for roughly 15% of the total volume. Moreover, the capitals of these countries were among the top 15% most liquid markets globally in terms of cross-border real estate investments. Property investments in Romania, Bulgaria and Slovakia are currently much smaller and hence less liquid. These countries are not covered in this publication.

The rapid growth in transaction volumes in the CEE region was clearly above the overall global trend but the CEE property markets still constitute only a small portion of global investment volumes. We expect that international property investors will maintain their interest in this region. There are several reasons why CEE direct property markets remain an attractive investment opportunity in our view.

First, returns have been compelling when compared to Western Europe. In 2019, the total return on CEE real estate properties amounted to more than 10% according to MSCI versus less than 6% in developed European markets on average. Despite its compression, the income return in CEE countries of almost 5.5% remains comparatively attractive and has exceeded the Western European market by an average 130 basis points since 2010. As the prime yields (average over different segments) are just below the 5.5% mark, net cashflows of new investments continue to deliver attractive return to new investors, in our view. Moreover, we expect that investors will continue to benefit from ongoing yield compression, although this is declining.

CEE income returns are higher than in Western Europe

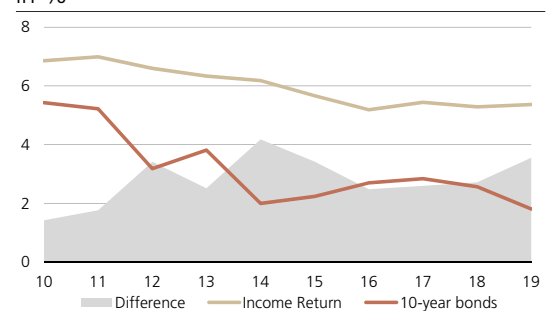
IPD income returns (EUR), in %, all properties



Source: MSCI IPD, UBS. *GDP-weighted average of FR, DE, NL, ES, UK, CH.

Income returns are attractive despite the recent yield compression

GDP-weighted average of Poland and Czech Rep., in %



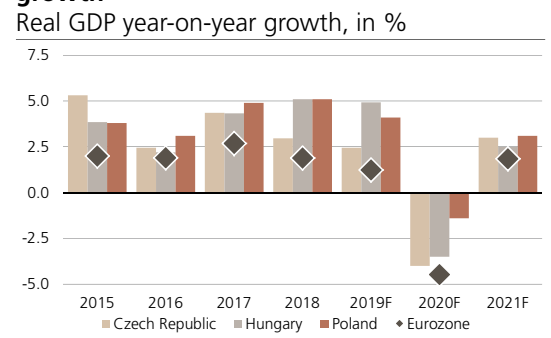
Source: MSCI IPD, Bloomberg, UBS.

Second, given that foreign investors have the opportunity to finance CEE property investments in their own currency at historically very low interest rates, the leveraged returns on investments look even more appealing in a broad European context. The average volatility of CEE exchange rates versus the euro has fallen significantly over the last decade. Though some more volatility given the current situation looks likely, the integration of CEE economies in the wider European economy should lead to less fluctuation again. Moreover, according to UBS currency forecasts, the Polish zloty and the Czech koruna are expected to appreciate slightly over the next few quarters, , recouping some of the losses suffered over the past weeks.

Finally, the economic and political stability of CEE countries has improved. They are growing faster than countries in Western Europe: economic growth in the CEE region (Poland, Czech Republic and Hungary) averaged almost 4% in real terms in 2019 according to UBS IB estimates. Though a recession in 2020 is highly probable (UBS IB estimates a GDP decline of almost 2.5% on average), the CEE economies will likely grow by roughly 3% in 2021. Hence, economic growth in the CEE region should be higher than in the Eurozone in both 2020 and 2021. After 2020, this should translate into better employment prospects, robust wage increases and higher purchasing power, supporting the take-up demand.

We recommend investors to focus on office and industrial properties. Investments in retail markets have in our opinion a less attractive risk-return profile. In any case, investors should understand the local demand and supply conditions before investing.

Rental growth supported by economic growth



Source: UBS IB, UBS. F= UBS Forecast

Relative risk-return relationship of direct real estate investments globally

This assessment considers the attractiveness of a market compared to its own historical data

	Overall	Office	Retail	Residential	Logistics/ Industrial
US	■ ■	🏢🏢	🏪	🏠🏠🏠	🚚🚚🚚
Canada	■	🏢	🏪	🏠🏠	🚚🚚
UK	■ ■	🏢🏢	🏪	🏠🏠	🚚🚚
Eurozone ex Germany	■ ■	🏢🏢	🏪	🏠🏠🏠	🚚🚚🚚
Germany	■ ■	🏢🏢	🏪	🏠🏠🏠	🚚🚚🚚
Central & Eastern Europe	■ ■	🏢🏢🏢	🏪	🏠🏠	🚚🚚🚚
Switzerland	■ ■	🏢🏢	🏪	🏠🏠	🚚🚚
Japan	■	🏢🏢	🏪	🏠🏠	🚚🚚
China	■	🏢	🏪	🏠🏠	🚚🚚
Australia	■	🏢	🏪	🏠🏠	🚚🚚
Hong Kong	■	🏢	🏪	🏠	🚚🚚
Singapore	■ ■	🏢🏢🏢	🏪🏪	🏠🏠	🚚🚚
Brazil	■ ■	🏢🏢	🏪🏪	🏠🏠	🚚🚚

■ Unfavorable ■ ■ Balanced ■ ■ ■ Favorable

Source: UBS. *Favorable*: An investor entering the market today would achieve attractive risk-adjusted returns over the investment horizon of 7-10 years. *Balanced*: We advise remaining invested and only adding exposure selectively. *Unfavorable*: Market conditions are currently unattractive. We advise cutting exposure or extending the investment horizon. For further details see the report UBS Global direct real estate: [LINK](#) (internal only).

Office markets

Historically low vacancy rates, but slight increases likely

Market insights:

- The office market has attracted the lion's share of investors' money since 2015 (60% of the total volume). According to Colliers, prime yields for office space are 4.25% in Prague, 4.5% in Warsaw and 5% in Budapest. Krakow and Wroclaw, Polish regional centers, follow with prime yields just below 6%. Therefore, the yields are compelling as compared to about 3% in Western Europe.
- Increasing labor and construction costs have supported rental growth in some Polish cities. Prime rents in Warsaw average 24 EUR/m²/month, slightly higher than in Prague. In Polish regional cities rents are considerably lower, at 15 EUR/m²/month. This is the level of A class offices in Budapest, as well.
- Vacancy rates have been falling in CEE markets. In Prague, the share of vacant offices is the lowest among the three capital cities. It fell from 16% in 2015 to below 5% in 2019. In Budapest, 6% of stock is empty, a third of what was available in 2012. The Polish office market has the highest vacancy rates in the region. In Warsaw, 8.2% of the stock is vacant, the lowest number since 2012 according to Colliers. In regional cities, 9% of the existing spaces are empty on average.
- The demand for newly constructed surfaces should remain robust after 2020, in our view, given the positive economic growth expectations. In particular, employment growth in the business services sector is strong. Central European markets are still trailing their Western counterparts with respect to the stock of modern office spaces. New take-up demand is expected to absorb the biggest portion of new area. A continued relocation from older to modern high-quality offices is expected.
- Consequently, rental growth will likely remain positive, in our opinion. This should support further investor demand and yield compression.

Risks:

- New surfaces under construction are considerable though, according to Colliers. Until 2021, new supply is expected equivalent to 10% of the current stock in Prague, 15% in Budapest and 20% in Warsaw. In most Polish regional markets supply growth may be even more considerable.
- While a high portion of spaces under construction is pre-let, new take-up demand has likely peaked in 2018 already. Hence, we believe vacancy rates have reached a trough and may slightly increase. Hence, an ongoing economic growth after the recession in 2020 is prerequisite.

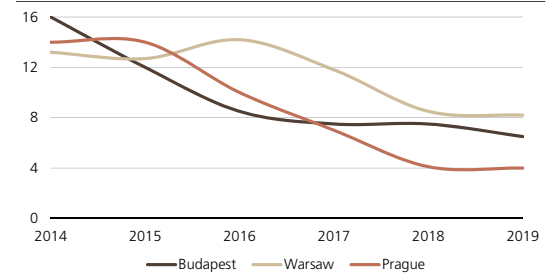
Investment view:

- The office markets in the CEE region still offer attractive investment opportunities, in our view. Relatively high income stream and further yield compression in market average will likely benefit potential property owners.
- Unless a long-term economic recession hits the region, which is not our base case, the risks of falling rents and capital losses are manageable. However, expected new supply entering local markets needs to be considered.

Overall assessment: attractive

Vacancy rates have decreased

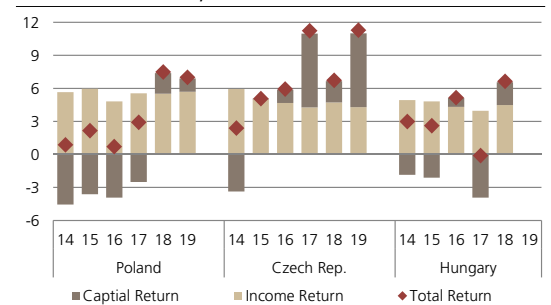
Office vacancy rates as of year end*, in %



Source: Colliers, JLL, Knight Frank, DB, UBS. *2019 - the last available data

Capital values started to increase

MSCI IPD returns, in %



Source: MSCI IPD, UBS

Industrial markets

Beneficial infrastructure investments

Market insights:

- The industrial prime yields have converged strongly in the region, but remain higher than in Western Europe (e.g. below 4% in Germany, according to JLL in 2019). Investors can earn about 5.5% in Prague, 6.5% in Warsaw and 7% in Budapest according to Colliers.
- Moreover, CEE warehousing and logistics should benefit from ongoing massive infrastructure investments in the next few years. Better motorway and railroad network, partially financed by EU cohesion funds, increase the potential take-up demand and support further yield compression.
- The demand for logistics and warehousing spaces is further supported by strong economic and e-commerce growth.
- While the Polish logistics market benefits from its central location between Western Europe and Russia, Hungary and Czech Republic have a stronger focus on their internal markets. Hence, the Polish logistics properties show higher levels of liquidity.
- Despite recent increases, operating costs in CEE, like rents or salaries, are still lower than in Western Europe. For example in Warsaw, the most expensive CEE city, prime rents are close to EUR 5/m²/month, about 25% below the level in Munich, Hamburg or Stuttgart.

Risks:

- Due to the increasing supply of modern surfaces, vacancy rates have risen. In Poland, more than 6% of current modern stock are empty; in Czech Republic the rate is just below 5%, according to Colliers. In Hungarian capital region, vacancy rates headed downwards in 2019, to around 2%.
- Vacancy rates are likely to continue to rise as new surfaces under construction are considerable. According to Colliers, the modern industrial stock may be extended by 10% in Poland and Hungary over the next few quarters, and by more than 5% in the Czech Republic.
- While the risk of rising vacancies should not be ignored, we expect the new supply to be well absorbed after the economic recovery sets in in the second half of 2020.

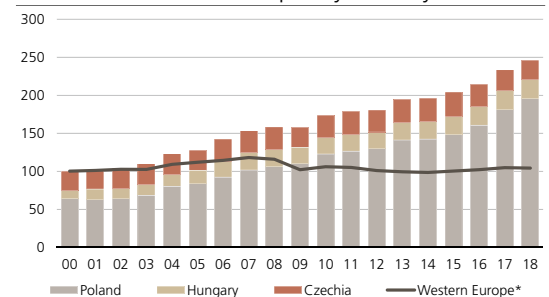
Investment view:

- Investments in industrial properties, with special focus on logistics, offer attractive investment opportunities in our view.
- We recommend investors to focus on locations targeted by infrastructure investments that potentially benefit further capital gains.

Overall assessment: attractive

Growing demand for goods

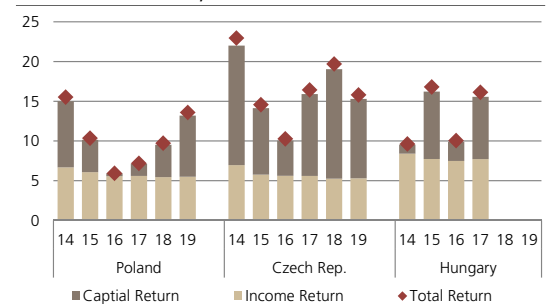
Goods transport, tonnes-kilometers, index 2000 = 100. Index for CEE is split by country.



Source: OECD, UBS. *Sum of FR, DE, IT, NL, ES, UK.

Industrial real estate with highest returns

MSCI IPD returns, in %



Source: MSCI IPD, UBS

Retail markets

Prudence warranted

Market insights:

- According to Colliers, shopping center prime yields are 4% in Warsaw, 4.75% in Prague and 5.5% in Budapest, somewhat lower than in previous years. Prime yields have hence reached similar levels to Western Europe. E.g. in Germany, shopping center prime yields are close to 4.5% according to JLL.
- Household expenditures, purchasing power and retail sales in Poland, Hungary and the Czech Republic have increased faster than in Western Europe. This has supported the demand for retail surfaces and led to a strong increase of new supply.
- Prime rents in shopping centers are the highest in Prague and amount to 150 EUR/m²/month according to CBRE. In Warsaw and Budapest the level is slightly lower at roughly 120 EUR/m²/month according to JLL. In other Polish regional markets, the level is significantly below those values, at roughly 50 EUR/m²/month.
- Developers of shopping centers concentrate on multi-functional projects incl. entertainment and catering amenities as well. Traditional space concepts are less attractive and may underperform.
- Poland restricted the opening times of shopping centers last year. They have to stay closed on most Sundays during the year. This one-off event was already priced in by the appraisers: the capital return in Poland was strongly negative in 2019.

Risks:

- Retail markets, especially in the biggest cities, have reached a high level of saturation. Therefore, new supply has been trending down.
- Following the experience of developed countries, take-up demand may slow due to further growth of online shopping. Although the level of e-commerce market penetration is lower than in Western Europe, the turnover has been growing faster than, for example, in Germany or France.

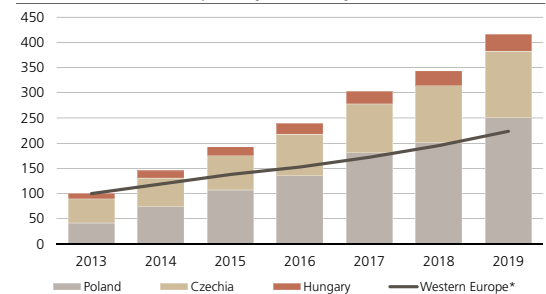
Investment view:

- We recommend investors to remain cautious towards investments in secondary locations. Selectivity is key. At the local level some properties may still be an attractive addition to diversified portfolios.
- We do not expect further yield compression. Hence, investors should focus on stable income flows at the property level.

Overall assessment: unfavorable

Rapid e-commerce growth puts pressure on retail space

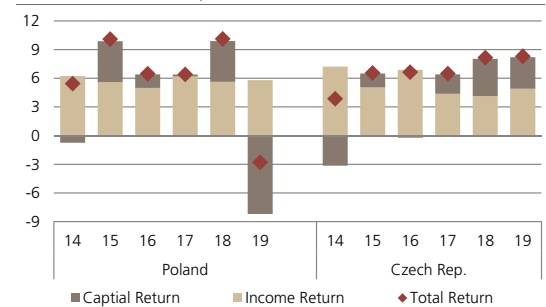
B2C e-commerce turnover, index 2013 = 100. Index for CEE is split by country.



Source: Ecommerce Europe, UBS. *Sum of FR, DE, UK, IT, NL, ES.

Challenging market despite decent returns

MSCI IPD returns, in %



Source: MSCI IPD, UBS

Residential markets

New opportunities arise

Market insights:

- The rental residential market is less developed than in Western Europe, as more than three quarters of the CEE population live in owner-occupied homes.
- Supply of new homes reached historically high levels in 2019, but it is lagging the demand growth. Undersupply of modern housing stimulates the price growth. Real wage growth, a more attractive mortgage financing environment and increasing construction costs (land, labor and material costs) all support higher prices.
- In Poland (average of 7 biggest cities), real housing prices are 25% higher than in 2014. In Czech Republic, the growth amounted to 30% and in Hungary almost to 90%. Currently, housing in Prague is the most expensive: a square meter cost there more than EUR 3,000/m². Warsaw follows with prices close to EUR 2,500/m². In Budapest as well as in Gdansk and Krakow, a square meter costs around EUR 2,000.
- The growth in employment and the attractiveness of CEE job markets for office locations have revealed a structural shortage of modern residential rental units in urban centers.
- In Warsaw as well as in other Polish cities, rental returns on the primary market are estimated at between 5% and 6%. In the Czech Republic however, such investments yield less than 4% according to the Czech National Bank.

Risks:

- Price growth has outpaced wage growth, and the affordability of modern urban housing has decreased. Due to the current lockdown, we expect the residential market to slow down this year. Afterwards, we expect a positive price growth again but at a slower pace than until now. The growth will likely shift to cheaper suburban locations.
- In the long term, the demand on the residential market may suffer due to low population growth. Over the last decade, the total population in Poland, Czech Republic and Hungary has stagnated. According to World Bank forecasts, the population is expected to shrink, with Poland and Hungary affected the most.
- There are differences in landlord-tenant laws between Poland, Czech Republic and Hungary. Investors are advised to contact local market specialists.

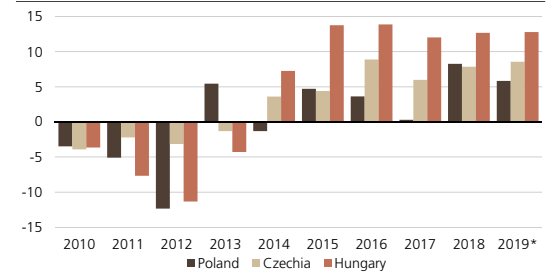
Investment view:

- Given the high number of completions and rising land prices, investors should focus on value-add properties, incl. redevelopments or restructurings.
- Investors should focus on locations, where international companies are actively investing.

Overall assessment: balanced

Residential property prices are on the rise

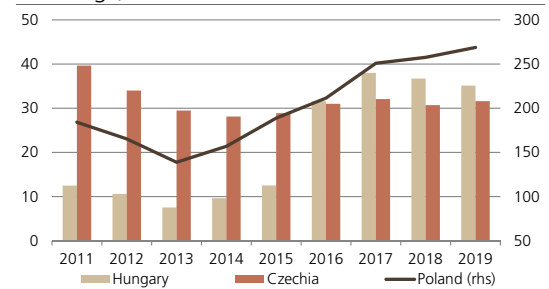
Real year-on-year growth rates, in %



Source: National banks, Bloomberg, UBS. *CZ: 3rd quarter, HU: 2nd quarter.

Construction boom in Poland and Hungary shows signs of slowdown

Construction permits issued for residential dwellings, in thousand



Source: Statistics Poland, HCSO, CZSO, UBS.

Non-Traditional Assets

Non-traditional asset classes are alternative investments that include hedge funds, private equity, real estate, and managed futures (collectively, alternative investments). Interests of alternative investment funds are sold only to qualified investors, and only by means of offering documents that include information about the risks, performance and expenses of alternative investment funds, and which clients are urged to read carefully before subscribing and retain. An investment in an alternative investment fund is speculative and involves significant risks. Specifically, these investments (1) are not mutual funds and are not subject to the same regulatory requirements as mutual funds; (2) may have performance that is volatile, and investors may lose all or a substantial amount of their investment; (3) may engage in leverage and other speculative investment practices that may increase the risk of investment loss; (4) are long-term, illiquid investments, there is generally no secondary market for the interests of a fund, and none is expected to develop; (5) interests of alternative investment funds typically will be illiquid and subject to restrictions on transfer; (6) may not be required to provide periodic pricing or valuation information to investors; (7) generally involve complex tax strategies and there may be delays in distributing tax information to investors; (8) are subject to high fees, including management fees and other fees and expenses, all of which will reduce profits.

Interests in alternative investment funds are not deposits or obligations of, or guaranteed or endorsed by, any bank or other insured depository institution, and are not federally insured by the Federal Deposit Insurance Corporation, the Federal Reserve Board, or any other governmental agency. Prospective investors should understand these risks and have the financial ability and willingness to accept them for an extended period of time before making an investment in an alternative investment fund and should consider an alternative investment fund as a supplement to an overall investment program.

In addition to the risks that apply to alternative investments generally, the following are additional risks related to an investment in these strategies:

- **Hedge Fund Risk:** There are risks specifically associated with investing in hedge funds, which may include risks associated with investing in short sales, options, small-cap stocks, "junk bonds," derivatives, distressed securities, non-U.S. securities and illiquid investments.
- **Managed Futures:** There are risks specifically associated with investing in managed futures programs. For example, not all managers focus on all strategies at all times, and managed futures strategies may have material directional elements.
- **Real Estate:** There are risks specifically associated with investing in real estate products and real estate investment trusts. They involve risks associated with debt, adverse changes in general economic or local market conditions, changes in governmental, tax, real estate and zoning laws or regulations, risks associated with capital calls and, for some real estate products, the risks associated with the ability to qualify for favorable treatment under the federal tax laws.
- **Private Equity:** There are risks specifically associated with investing in private equity. Capital calls can be made on short notice, and the failure to meet capital calls can result in significant adverse consequences including, but not limited to, a total loss of investment.
- **Foreign Exchange/Currency Risk:** Investors in securities of issuers located outside of the United States should be aware that even for securities denominated in U.S. dollars, changes in the exchange rate between the U.S. dollar and the issuer's "home" currency can have unexpected effects on the market value and liquidity of those securities. Those securities may also be affected by other risks (such as political, economic or regulatory changes) that may not be readily known to a U.S. investor.

Appendix

UBS Chief Investment Office's ("CIO") investment views are prepared and published by the Global Wealth Management business of UBS Switzerland AG (regulated by FINMA in Switzerland) or its affiliates ("UBS"). The investment views have been prepared in accordance with legal requirements designed to promote **the independence of investment research**.

Generic investment research – Risk information: This publication is **for your information only** and is not intended as an offer, or a solicitation of an offer, to buy or sell any investment or other specific product. The analysis contained herein does not constitute a personal recommendation or take into account the particular investment objectives, investment strategies, financial situation and needs of any specific recipient. It is based on numerous assumptions. Different assumptions could result in materially different results. Certain services and products are subject to legal restrictions and cannot be offered worldwide on an unrestricted basis and/or may not be eligible for sale to all investors. All information and opinions expressed in this document were obtained from sources believed to be reliable and in good faith, but no representation or warranty, express or implied, is made as to its accuracy or completeness (other than disclosures relating to UBS). All information and opinions as well as any forecasts, estimates and market prices indicated are current as of the date of this report, and are subject to change without notice. Opinions expressed herein may differ or be contrary to those expressed by other business areas or divisions of UBS as a result of using different assumptions and/or criteria.

In no circumstances may this document or any of the information (including any forecast, value, index or other calculated amount ("Values")) be used for any of the following purposes (i) valuation or accounting purposes; (ii) to determine the amounts due or payable, the price or the value of any financial instrument or financial contract; or (iii) to measure the performance of any financial instrument including, without limitation, for the purpose of tracking the return or performance of any Value or of defining the asset allocation of portfolio or of computing performance fees. By receiving this document and the information you will be deemed to represent and warrant to UBS that you will not use this document or otherwise rely on any of the information for any of the above purposes. UBS and any of its directors or employees may be entitled at any time to hold long or short positions in investment instruments referred to herein, carry out transactions involving relevant investment instruments in the capacity of principal or agent, or provide any other services or have officers, who serve as directors, either to/for the issuer, the investment instrument itself or to/for any company commercially or financially affiliated to such issuers. At any time, investment decisions (including whether to buy, sell or hold securities) made by UBS and its employees may differ from or be contrary to the opinions expressed in UBS research publications. Some investments may not be readily realizable since the market in the securities is illiquid and therefore valuing the investment and identifying the risk to which you are exposed may be difficult to quantify. UBS relies on information barriers to control the flow of information contained in one or more areas within UBS, into other areas, units, divisions or affiliates of UBS. Futures and options trading is not suitable for every investor as there is a substantial risk of loss, and losses in excess of an initial investment may occur. Past performance of an investment is no guarantee for its future performance. Additional information will be made available upon request. Some investments may be subject to sudden and large falls in value and on realization you may receive back less than you invested or may be required to pay more. Changes in foreign exchange rates may have an adverse effect on the price, value or income of an investment. The analyst(s) responsible for the preparation of this report may interact with trading desk personnel, sales personnel and other constituencies for the purpose of gathering, synthesizing and interpreting market information.

Tax treatment depends on the individual circumstances and may be subject to change in the future. UBS does not provide legal or tax advice and makes no representations as to the tax treatment of assets or the investment returns thereon both in general or with reference to specific client's circumstances and needs. We are of necessity unable to take into account the particular investment objectives, financial situation and needs of our individual clients and we would recommend that you take financial and/or tax advice as to the implications (including tax) of investing in any of the products mentioned herein.

This material may not be reproduced or copies circulated without prior authority of UBS. Unless otherwise agreed in writing UBS expressly prohibits the distribution and transfer of this material to third parties for any reason. UBS accepts no liability whatsoever for any claims or lawsuits from any third parties arising from the use or distribution of this material. This report is for distribution only under such circumstances as may be permitted by applicable law. For information on the ways in which CIO manages conflicts and maintains independence of its investment views and publication offering, and research and rating methodologies, please visit www.ubs.com/research. Additional information on the relevant authors of this publication and other CIO publication(s) referenced in this report; and copies of any past reports on this topic; are available upon request from your client advisor.

Important Information About Sustainable Investing Strategies: Sustainable investing strategies aim to consider and incorporate environmental, social and governance (ESG) factors into investment process and portfolio construction. Strategies across geographies and styles approach ESG analysis and incorporate the findings in a variety of ways. Incorporating ESG factors or Sustainable Investing considerations may inhibit the portfolio manager's ability to participate in certain investment opportunities that otherwise would be consistent with its investment objective and other principal investment strategies. The returns on a portfolio consisting primarily of sustainable investments may be lower or higher than portfolios where ESG factors, exclusions, or other sustainability issues are not considered by the portfolio manager, and the investment opportunities available to such portfolios may differ. Companies may not necessarily meet high performance standards on all aspects of ESG or sustainable investing issues; there is also no guarantee that any company will meet expectations in connection with corporate responsibility, sustainability, and/or impact performance.

Distributed to US persons by UBS Financial Services Inc. or UBS Securities LLC, subsidiaries of UBS AG. UBS Switzerland AG, UBS Europe SE, UBS Bank, S.A., UBS Brasil Administradora de Valores Mobiliários Ltda, UBS Asesores Mexico, S.A. de C.V., UBS Securities Japan Co., Ltd, UBS Wealth Management Israel Ltd and UBS Menkul Degerler AS are affiliates of UBS AG. UBS Financial Services Incorporated of Puerto Rico is a subsidiary of UBS Financial Services Inc. **UBS Financial Services Inc. accepts responsibility for the content of a report prepared by a non-US affiliate when it distributes reports to US persons. All transactions by a US person in the securities mentioned in this report should be effected through a US-registered broker dealer affiliated with UBS, and not through a non-US affiliate. The contents of this report have not been and will not be approved by any securities or investment authority in the United States or elsewhere. UBS Financial Services Inc. is not acting as a municipal advisor to any municipal entity or obligated person within the meaning of Section 15B of the Securities Exchange Act (the "Municipal Advisor Rule") and the opinions or views contained herein are not intended to be, and do not constitute, advice within the meaning of the Municipal Advisor Rule.**

External Asset Managers / External Financial Consultants: In case this research or publication is provided to an External Asset Manager or an External Financial Consultant, UBS expressly prohibits that it is redistributed by the External Asset Manager or the External Financial Consultant and is made available to their clients and/or third parties.

Austria: This publication is not intended to constitute a public offer under Austrian law. It is distributed only for information purposes to clients of UBS Europe SE, Niederlassung Österreich, with place of business at Wächtergasse 1, A-1010 Wien. UBS Europe SE, Niederlassung Österreich is subject to the joint supervision of the European Central Bank ("ECB"), the German Central Bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Austrian Financial Market Authority (Finanzmarktaufsicht), to which this publication has not been submitted for approval. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB. **Bahrain:** UBS is a Swiss bank not licensed, supervised or regulated in Bahrain by the Central Bank of Bahrain and does not undertake banking or investment business activities in Bahrain. Therefore, clients have no protection under local banking and investment services laws and regulations. **Brazil:** This publication is not intended to constitute a public offer under Brazilian law or a research analysis report as per the definition contained under the Comissão de Valores Mobiliários ("CVM") Instruction 598/2018. It is distributed only for information purposes to clients of UBS Brasil Administradora de Valores Mobiliários Ltda. and/or of UBS Consenso Investimentos Ltda., entities regulated by CVM. **Canada:** In Canada, this publication is distributed to clients of UBS Wealth Management Canada by UBS Investment Management Canada Inc. **China:** This report is prepared by UBS Switzerland AG or its offshore subsidiary or affiliate (collectively as "UBS Offshore"). UBS Offshore is an entity incorporated out of China and is not licensed, supervised or regulated in China to carry out banking or securities business. The recipient should not contact the analysts or UBS Offshore which produced this report for advice as they are not licensed to provide securities investment advice in China. UBS Investment Bank (including Research) has its own wholly independent research and views which at times may vary from the views of UBS Global Wealth Management. This report shall not be regarded as providing specific securities related analysis. The recipient should not use this document or otherwise rely on any of the information contained in this report in making investment decisions and UBS takes no responsibility in this regard. **Czech Republic:** UBS is not a licensed bank in the Czech Republic and thus is not allowed to provide regulated banking or investment services in the Czech Republic. Please notify UBS if you do not wish to receive any further correspondence. **Denmark:** This publication is not intended to constitute a public offer under Danish law. It is distributed only for information purposes to clients of UBS Europe SE, Denmark Branch, filial af UBS Europe SE, with place of business at Sankt Annæ Plads 13, 1250 Copenhagen, Denmark, registered with the Danish Commerce and Companies Agency, under No. 38 17 24 33. UBS Europe SE, Denmark Branch, filial af UBS Europe SE is subject to the joint supervision of the European Central Bank ("ECB"), the German Central Bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Danish Financial Supervisory Authority (Finanstilsynet), to which this publication has not been submitted for approval. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB. **France:** This publication is distributed by UBS (France) S.A., French "société anonyme" with share capital of € 132.975.556, 69, boulevard Haussmann F-75008 Paris, R.C.S. Paris B 421 255 670, to its clients and prospects. UBS (France) S.A. is a provider of investment services duly authorized according to the terms of the "Code Monétaire et Financier", regulated by French banking and financial authorities as the "Autorité de Contrôle Prudential et de Résolution". **Germany:** This publication is not intended to constitute a public offer under German law. It is distributed only for information purposes to clients of UBS Europe SE, Germany, with place of business at Bockenheimer Landstrasse 2-4, 60306 Frankfurt am Main. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the European Central Bank ("ECB"), and supervised by the ECB, the German Central Bank (Deutsche Bundesbank) and the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), to which this publication has not been submitted for approval. **Greece:** UBS Switzerland AG and its affiliates (UBS) are not licensed as a bank or financial institution under Greek legislation and do not provide banking and financial services in Greece. Consequently, UBS provides such services from branches outside of Greece, only. This document may not be considered as a public offering made or to be made to residents of Greece. **Hong Kong:** This publication is distributed to clients of UBS AG Hong Kong Branch by UBS AG Hong Kong Branch, a licensed bank under the Hong Kong Banking Ordinance and a registered institution under the Securities and Futures Ordinance. UBS AG Hong Kong Branch is incorporated in Switzerland with limited liability. **India:** UBS Securities India Private Ltd. (Corporate Identity Number U67120MH1996PTC097299) 2/F, 2 North Avenue, Maker Maxity, Bandra Kurla Complex, Bandra (East), Mumbai (India) 400051. Phone: +912261556000. It provides brokerage services bearing SEBI Registration Number INZ000259830; merchant banking services bearing SEBI Registration Number: INM000010809 and Research Analyst services bearing SEBI Registration Number: INH000001204. UBS AG, its affiliates or subsidiaries may have debt holdings or positions in the subject Indian company/companies. Within the past 12 months, UBS AG, its affiliates or subsidiaries may have received compensation for non-investment banking securities-related services and/or non-securities services from the subject Indian company/companies. The subject company/companies may have been a client/clients of UBS AG, its affiliates or subsidiaries during the 12 months preceding the date of distribution of the research report with respect to investment banking and/or non-investment banking securities-related services and/or non-securities services. With regard to information on associates, please refer to the Annual Report at: http://www.ubs.com/global/en/about_ubs/investor_relations/

Appendix

annualreporting.html **Indonesia, Malaysia, Philippines, Thailand:** This material was provided to you as a result of a request received by UBS from you and/or persons entitled to make the request on your behalf. Should you have received the material erroneously, UBS asks that you kindly destroy/delete it and inform UBS immediately. Any and all advice provided and/or trades executed by UBS pursuant to the material will only have been provided upon your specific request or executed upon your specific instructions, as the case may be, and may be deemed as such by UBS and you. The material may not have been reviewed, approved, disapproved or endorsed by any financial or regulatory authority in your jurisdiction. The relevant investments will be subject to restrictions and obligations on transfer as set forth in the material, and by receiving the material you undertake to comply fully with such restrictions and obligations. You should carefully study and ensure that you understand and exercise due care and discretion in considering your investment objective, risk appetite and personal circumstances against the risk of the investment. You are advised to seek independent professional advice in case of doubt. **Israel:** UBS is a premier global financial firm offering wealth management, asset management and investment banking services from its headquarters in Switzerland and its operations in over 50 countries worldwide to individual, corporate and institutional investors. In Israel, UBS Switzerland AG is registered as Foreign Dealer in cooperation with UBS Wealth Management Israel Ltd., a wholly owned UBS subsidiary. UBS Wealth Management Israel Ltd. is a Portfolio Manager licensee which engages also in Investment Marketing and is regulated by the Israel Securities Authority. This publication is intended for information only and is not intended as an offer to buy or solicitation of an offer. Furthermore, this publication is not intended as an investment advice and/or investment marketing and is not replacing any investment advice and/or investment marketing provided by the relevant licensee which is adjusted to each person needs. The word "advice" and/or any of its derivatives shall be read and construed in conjunction with the definition of the term "investment marketing" as defined under the Israeli Regulation of Investment Advice, Investment Marketing and Portfolio Management Law, 1995. **Italy:** This publication is not intended to constitute a public offer under Italian law. It is distributed only for information purposes to clients of UBS Europe SE, Succursale Italia, with place of business at Via del Vecchio Politecnico, 3-20121 Milano. UBS Europe SE, Succursale Italia is subject to the joint supervision of the European Central Bank ("ECB"), the German Central Bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Bank of Italy (Banca d'Italia) and the Italian Financial Markets Supervisory Authority (CONSOB - Commissione Nazionale per le Società e la Borsa), to which this publication has not been submitted for approval. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB. **Jersey:** UBS AG, Jersey Branch, is regulated and authorized by the Jersey Financial Services Commission for the conduct of banking, funds and investment business. Where services are provided from outside Jersey, they will not be covered by the Jersey regulatory regime. UBS AG, Jersey Branch is a branch of UBS AG a public company limited by shares, incorporated in Switzerland whose registered offices are at Aeschenvorstadt 1, CH-4051 Basel and Bahnhofstrasse 45, CH 8001 Zurich. UBS AG, Jersey Branch's principal place business is 1, IFC Jersey, St Helier, Jersey, JE2 3BX. **Luxembourg:** This publication is not intended to constitute a public offer under Luxembourg law. It is distributed only for information purposes to clients of UBS Europe SE, Luxembourg Branch, with place of business at 33A, Avenue J. F. Kennedy, L-1855 Luxembourg. UBS Europe SE, Luxembourg Branch is subject to the joint supervision of the European Central Bank ("ECB"), the German Central bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Luxembourg supervisory authority (Commission de Surveillance du Secteur Financier), to which this publication has not been submitted for approval. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB. **Mexico:** This information is distributed by UBS Asesores México, S.A. de C.V. ("UBS Asesores"), an affiliate of UBS Switzerland AG, incorporated as a non-independent investment advisor under the Securities Market Law due to the relation with a Foreign Bank. UBS Asesores is a regulated entity and it is subject to the supervision of the Mexican Banking and Securities Commission ("CNBV"), which exclusively regulates UBS Asesores regarding the rendering of portfolio management, as well as on securities investment advisory services, analysis and issuance of individual investment recommendations, so that the CNBV has no surveillance faculties nor may have over any other service provided by UBS Asesores. UBS Asesores is registered before CNBV under Registry number 30060. You are being provided with this UBS publication or material because you have indicated to UBS Asesores that you are a Sophisticated Qualified Investor located in Mexico. The compensation of the analyst(s) who prepared this report is determined exclusively by research management and senior management of any entity of UBS Group to which such analyst(s) render services. **Nigeria:** UBS Switzerland AG and its affiliates (UBS) are not licensed, supervised or regulated in Nigeria by the Central Bank of Nigeria or the Nigerian Securities and Exchange Commission and do not undertake banking or investment business activities in Nigeria. **Portugal:** UBS Switzerland AG is not licensed to conduct banking and financial activities in Portugal nor is UBS Switzerland AG supervised by the Portuguese regulators (Bank of Portugal "Banco de Portugal" and Portuguese Securities Exchange Commission "Comissão do Mercado de Valores Mobiliários"). **Singapore:** This material was provided to you as a result of a request received by UBS from you and/or persons entitled to make the request on your behalf. Should you have received the material erroneously, UBS asks that you kindly destroy/delete it and inform UBS immediately. Clients of UBS AG Singapore branch are asked to please contact UBS AG Singapore branch, an exempt financial adviser under the Singapore Financial Advisers Act (Cap. 110) and a wholesale bank licensed under the Singapore Banking Act (Cap. 19) regulated by the Monetary Authority of Singapore, in respect of any matters arising from, or in connection with, the analysis or report. **Spain:** This publication is not intended to constitute a public offer under Spanish law. It is distributed only for information purposes to clients of UBS Europe SE, Sucursal en España, with place of business at Calle María de Molina 4, C.P. 28006, Madrid. UBS Europe SE, Sucursal en España is subject to the joint supervision of the European Central Bank ("ECB"), the German Central bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Spanish supervisory authority (Banco de España), to which this publication has not been submitted for approval. Additionally it is authorized to provide investment services on securities and financial instruments, regarding which it is supervised by the Comisión Nacional del Mercado de Valores as well. UBS Europe SE, Sucursal en España is a branch of UBS Europe SE, a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB. **Sweden:** This publication is not intended to constitute a public offer under Swedish law. It is distributed only for information purposes to clients of UBS Europe SE, Sweden Bankfilial, with place of business at Regeringsgatan 38, 11153 Stockholm, Sweden, registered with the Swedish Companies Registration Office under Reg. No 516406-1011. UBS Europe SE, Sweden Bankfilial is subject to the joint supervision of the European Central Bank ("ECB"), the German Central bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Swedish supervisory authority (Finansinspektionen), to which this publication has not been submitted for approval. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB. **Taiwan:** This material is provided by UBS AG, Taipei Branch in accordance with laws of Taiwan, in agreement with or at the request of clients/prospects. **UAE:** UBS is not licensed in the UAE by the Central Bank of UAE or by the Securities & Commodities Authority. The UBS AG Dubai Branch is licensed in the DIFC by the Dubai Financial Services Authority as an authorised firm. **UK:** This document is issued by UBS Wealth Management, a division of UBS AG which is authorised and regulated by the Financial Market Supervisory Authority in Switzerland. In the United Kingdom, UBS AG is authorised by the Prudential Regulation Authority and is subject to regulation by the Financial Conduct Authority and limited regulation by the Prudential Regulation Authority. Details about the extent of regulation by the Prudential Regulation Authority are available from us on request. A member of the London Stock Exchange. This publication is distributed to retail clients of UBS Wealth Management. Version 06/2019. CIO82652744

© UBS 2020. The key symbol and UBS are among the registered and unregistered trademarks of UBS. All rights reserved.