

2024 Equity Volatility Outlook

2024: Volatility to remain between Low and Mid in H1, shift to Mid-High in H2

13 DECEMBER 2023, CIO OFFICE & MACRO RESEARCH

AUTHOR

DJAAFAR ABALLECHE, CFA
daballeche@pictet.com

FLASH NOTE

SUMMARY

- Stock market volatility in 2023 has trended downwards, although with fluctuations throughout the year. The VIX index surged in the first quarter but declined rapidly thereafter. Volatility rebounded during the summer due to a surge in long-term interest rates but declined again on rising hopes for rate cuts.
- The US Federal Reserve has aggressively increased interest rates since March 2022. Despite this, corporate profitability has remained strong, thanks in part to government support and the long period of low rates before March 2022. The housing sector has also shown resilience because of low adjustable-rate mortgages. However, monetary tightening is eventually expected to catch up on corporate profits, potentially causing financing challenges for weaker companies.
- The volume of zero-dated (ODTE) options has doubled in 2023, but these should have a limited impact on the S&P 500's volatility as buy and sell flows remain in balance. Short-volatility strategies have lost their appeal due to the prevailing high interest rates. The current low volatility might attract investors towards long-volatility strategies, but this should not dramatically change the overall picture in the coming months.
- Unless a severe recession occurs, we expect volatility to be in a medium-to-low range in the first half of 2024 and a medium-to-high range in the second half. Selling volatility flows are expected to remain low, preventing volatility from persistently decreasing below 12% in 2024.

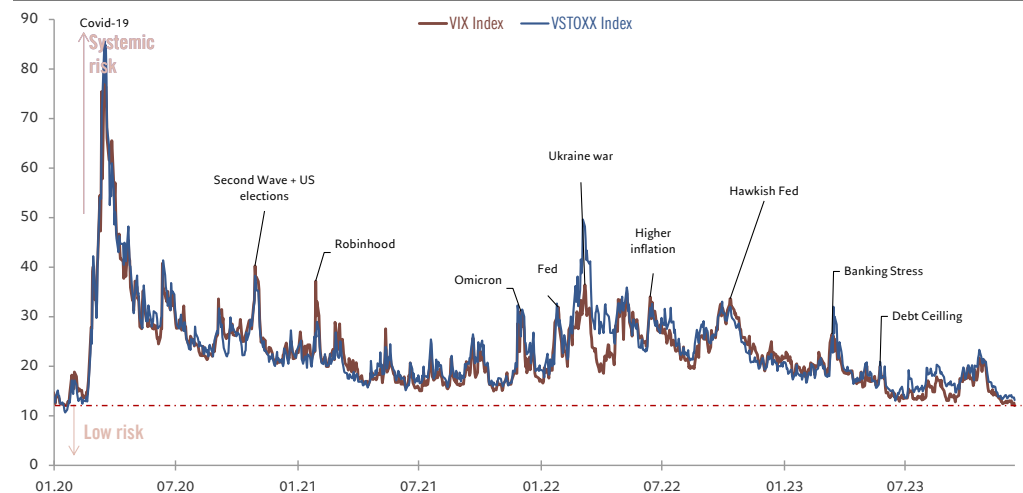
VOLATILITY DECLINED IN 2023 AMIDST THE MOST AGGRESSIVE HIKING CYCLE IN DECADES

Despite uncertainties surrounding banking crises, interest rates and the risk of recession, stock market volatility has trended down since the first quarter, with the VIX index surging at one stage on 13 March to over 30% following the collapse

For illustrative purposes. Past performance should not be taken as a guide to or guarantee of future performance. Performances and returns may increase or decrease as a result of currency fluctuations. There can be no assurance that these projections, forecasts or expected returns will be achieved. The projection is not based on simulated past performance.

of Silicon Valley Bank. Equity volatility rapidly declined thereafter and fell below 13% in June. A surge in long-term interest rates led to a rebound in September and October, but since then the growing conviction that the Fed had finished raising rates and could begin cutting them next year has contributed to a sharp decline in volatility again. By the end of November, despite numerous risks, the VIX index had dropped to its pre-pandemic level (see chart 1).

Chart 1: VIX index versus VSTOXX index, 2020-2023



Source: Pictet Wealth Management, FactSet, as of 12.12.2023

A RATE CUT BY THE FED SHOULD ALLEVIATE THE DOWNWARD PRESSURE ON CORRELATION BETWEEN STOCKS

In the most aggressive Fed rate-hiking cycle in decades, the US Federal Reserve (Fed) consistently increased interest rates between March 2022 and July 2023, when the fed funds rate reached 5.25-5.50%. Remarkably, while inflation has come down substantially, the US economy, including the labour market and housing, have remained resilient despite the rise in rates. Concurrently, the equity market is up substantially year to date, primarily driven by large technology companies boosted by the AI boom. Consequently, stock market concentration in the US has reached an all-time high, with the 10 largest stocks accounting for 33% of the S&P 500's market capitalisation. At time of writing (24 November), the S&P 500 had risen by 20.5% (in US dollars) year to date, with approximately 80% of gains attributable to the so-called "Magnificent Seven" tech-related stocks. This highly concentrated, tech-driven rally has led to a decrease in volatility. The trend has also been helped by a decline in the correlation among index components, as companies have reacted differently to the rise in interest rates. With the Fed expected to cut rates in the second half of 2024, correlation between S&P 500 stocks is likely to rise from the current low level. This, in turn, should alleviate some of the downward pressure on volatility.

For illustrative purposes. Past performance should not be taken as a guide to or guarantee of future performance. Performances and returns may increase or decrease as a result of currency fluctuations. There can be no assurance that these projections, forecasts or expected returns will be achieved. The projection is not based on simulated past performance.

THE IMPACT OF FLOWS ON EQUITY VOLATILITY SHOULD BE RELATIVELY LIMITED NEXT YEAR

Another notable development in 2023 has been the doubling of the volume of ODTE (zero-dated) options. According to CBOE, ODTE options accounted for 43% of the total volume of S&P 500 index options traded at end-June 2023, raising concerns about their impact on underlying price movements on the S&P 500. To address these concerns, CBOE says that customer flows have been fairly balanced between buys and sells. Dealers' gamma hedging, which includes short- and long-dated options on the S&P 500 index, has returned to the neutral zone after minor deviations, without significantly impacting the underlying market. The S&P 500's implied skew has also decreased since a sell-off between July and September that was driven by uncertainties surrounding interest rates. Throughout this year, the implied skew has remained relatively low compared to the levels seen in 2021 and the first quarter of 2022. By contrast, short volatility strategies have lost their appeal since a squeeze in February 2018. Assets under management in short VIX ETNs and ETFs have failed to recover fully and only a limited number of contracts are presently being traded. The unappealing nature of these strategies is exacerbated by elevated interest rates. Investors are reluctant to take on the additional risk involved in investing in complex strategies when cash and bonds are providing attractive yields. Given the current low level of equity volatility, it is more probable that we see an increase in buying flows rather than selling flows. This could result in a slight uptick in volatility in the upcoming months, although the overall impact should be minimal.

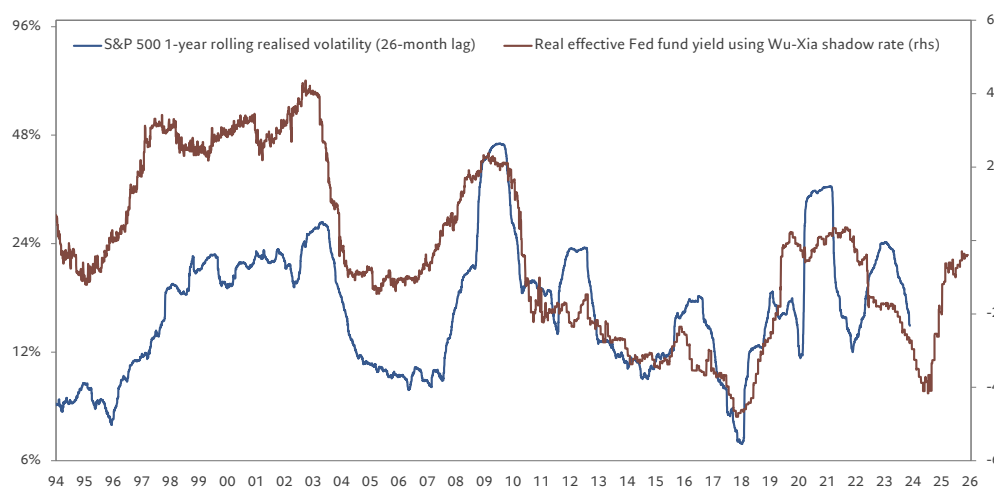
THE SLOW TRANSMISSION OF INTEREST RATES HIKES TO THE REAL ECONOMY

While interest rates have risen since 2022 to levels not seen since before the financial crisis, the impact on companies' profitability has yet to materialise. On the contrary, corporate profitability has reached a record high, still benefiting from the long period of low interest rates before 2022 and government support. As mentioned, the US housing sector has also shown resilience, supported by low adjustable-rate mortgages and relatively stable mortgage costs, which have provided some protection against the impact of higher interest rates. However, an extended period of elevated interest rates entails a gradual increase in net interest payments that will put corporate profits under pressure. Weaker companies could face more pronounced financing challenges, potentially resulting in increased defaults and cost-cutting measures such as job losses. The full impact of rising financing costs on both the US corporate and household sectors may still take several months to materialise. Our US economists expect a rate cut of 125 basis points from the Fed in the second half of 2024. This would still leave the fed funds rate at the relatively high level of 4-4.25%. Unless the Fed cuts rates to 3-4%, which is unlikely, refinancing and borrowing costs will remain high enough to put pressure on corporate profits and the housing sector. Given the long lag in monetary policy transmission, we anticipate that the impact of previous Fed rates will still be felt during the latter half of 2024.

For illustrative purposes. Past performance should not be taken as a guide to or guarantee of future performance. Performances and returns may increase or decrease as a result of currency fluctuations. There can be no assurance that these projections, forecasts or expected returns will be achieved. The projection is not based on simulated past performance.

The fundamental volatility model, which is based on real fed fund rates, suggests there is a lag of approximately 26 months between changes in the real Fed fund rates and one-year realised volatility on the S&P 500 index. Applying this model suggests that volatility will bottom out toward the end of H1 24 and rise in H2 (see chart 2) as previous Fed hikes continue to percolate through the economy. Such findings chime with the current economic backdrop: the US economy remains robust as a whole and corporate profitability is holding up, but pressure on profit margins is beginning to emerge. While we expect a meaningful economic slowdown in the US in H1 24, we believe the US equity market will avoid significant stress. A small, gradual pullback should not result in a substantial increase in volatility. Nevertheless, geopolitical tensions and the US presidential elections remain a risk for our volatility forecasts.

Chart 2: S&P 500 1-year realised volatility (with 26 months lag) versus Fed Fund effective rates combined with Wu-Xia shadow rates.



Source: Pictet Wealth Management, FactSet, 28.11.2023

CONCLUSION

In conclusion, we anticipate that the full impact of high interest rates will be felt from the second half of 2024 onwards. Our fundamental volatility model, which is based on the lagged effect of interest rates on realised volatility on the S&P 500, suggests a decline in volatility during the first half of next year, followed by a gradual increase in the second half. However, it is important to note that our model does not account for short-term risks such as data surprises or unpredictable external shocks. These could keep volatility higher than what the model implies in the first half of the year. There is, for example, the possibility of an upside surprise in inflation, which could compel the Fed to raise interest rates again or maintain them at high levels for longer than the market is expecting.

By contrast, we do not believe the flow of funds into volatility strategies will have a significant impact on volatility trends in 2024. The combination of high interest rates and the current low volatility makes short volatility strategies unappealing. Consequently, we do not think the drop in the VIX index below 12 is sustainable.

For illustrative purposes. Past performance should not be taken as a guide to or guarantee of future performance. Performances and returns may increase or decrease as a result of currency fluctuations. There can be no assurance that these projections, forecasts or expected returns will be achieved. The projection is not based on simulated past performance.

The current low volatility level may attract buyers interested in long volatility strategies, but this may not have much of an impact on raising it in 2024. Considering all these factors together, we believe the VIX will stay within a medium-to-low range during the first half of the year and transition to a medium-to-high range in the second half of 2024. In other words, we expect volatility to fluctuate between 12% and 18% for much of the first half of 2024, and between 15% and 22% for most of the second half.

For illustrative purposes. Past performance should not be taken as a guide to or guarantee of future performance. Performances and returns may increase or decrease as a result of currency fluctuations. There can be no assurance that these projections, forecasts or expected returns will be achieved. The projection is not based on simulated past performance.

DISCLAIMERS

Distributors: Banque Pictet & Cie SA, Route des Acacias 60, 1211 Geneva 73, Switzerland and Bank Pictet & Cie (Europe) AG, Neue Mainzer Str. 1 60311 Frankfurt am Main Germany.

Banque Pictet & Cie SA is established in Switzerland, exclusively licensed under Swiss Law and therefore subject to the supervision of the Swiss Financial Market Supervisory Authority (FINMA).

Bank Pictet & Cie (Europe) AG is established in Germany, authorised and regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht, the German Federal Financial Supervisory Authority (Bafin).

This marketing communication is not intended for persons who are citizens of, domiciled or resident in, or entities registered in a country or a jurisdiction in which its distribution, publication, provision or use would violate current laws and regulations.

The information, data and analysis furnished in this document are disclosed for information purposes only. They do not amount to any type of recommendation, either general or tailored to the personal circumstances of any person. Unless specifically stated otherwise, all price information is indicative only. No entity of the Pictet Group may be held liable for them, nor do they constitute an offer or an invitation to buy, sell or subscribe to securities or other financial instruments. The information contained herein is the result neither of financial analysis within the meaning of the Swiss Bankers Association's Directives on the Independence of Financial Research, nor of investment research for the purposes of the relevant EU MiFID provisions. 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.

Except for any obligations that any entity of the Pictet Group might have towards the addressee, the addressee should consider the suitability of the transaction to individual objectives and independently assess, with a professional advisor, the specific financial risks as well as legal, regulatory, credit, tax and accounting consequences.

Furthermore, the information, opinions and estimates in this document reflect an evaluation as of the date of initial publication and may be changed without notice. The Pictet Group is not under any obligation to update or keep current the information contained herein. In case this document refers to the value and income of one or more securities or financial instruments, it is based on rates from the customary sources of financial information that may fluctuate. The market value of financial instruments may vary on the basis of economic, financial or political changes, currency fluctuations, the remaining term, market conditions, the volatility and solvency of the issuer or the benchmark issuer. Some investments may not be readily realizable since the market in the securities can be illiquid. Moreover, exchange rates may have a positive or negative effect on the value, the price or the income of the securities or the related investments mentioned in this document. When investing in emerging countries, please note that the political and economic situation in those countries is significantly less stable than in industrialized countries. They are much more exposed to the risks of rapid political change and economic setbacks.

Past performance must not be considered an indicator or guarantee of future performance, and the addressees of this document are fully responsible for any investments they make. No express or implied warranty is given as to future performance. Moreover, forecasts are not a reliable indicator of future performance. The content of this document can only be read and/or used by its addressee. The Pictet Group is not liable for the use, transmission or

exploitation of the content of this document. Therefore, any form of reproduction, copying, disclosure, modification and/or publication of the content is under the sole liability of the addressee of this document, and no liability whatsoever will be incurred by the Pictet Group. The addressee of this document agrees to comply with the applicable laws and regulations in the jurisdictions where they use the information reproduced in this document.

This marketing publication is issued by Banque Pictet & Cie SA. This marketing publication and its content may be cited provided that the source is indicated. All rights reserved. Copyright 2023.

Distributor: Bank Pictet & Cie (Europe) AG, London branch ("Pictet London Branch")

This is a marketing communication distributed by Pictet London Branch.

This document sets forth neither a personal recommendation tailored to the needs, objectives and financial situation of any individual or company (investment advice as defined in the Financial Conduct Authority's Handbook of rules and guidance (the "FCA Handbook")), nor the results of investment research within the meaning of the FCA Handbook. Moreover, it does not constitute an offer, or an invitation to buy, sell or subscribe to securities or other financial instruments, nor is it meant as a proposal for the conclusion of any type of agreement. Furthermore, this document should not be considered a suitability report as Pictet London Branch has not received all the necessary information on the recipient to complete its suitability assessment that covers the recipient's knowledge and experience, tolerance to risk, sustainability preferences, if any, investment needs and the recipient's ability to absorb financial risk. Should its addressee decide to proceed to any transaction in relation to a financial product referred to herein, this will be in his sole responsibility, and the

suitability/appropriateness of the transaction and other financial, legal and tax aspects should be assessed by an expert.

Any information contained in this document is disclosed for information purposes only, and neither the producer nor the distributor can be held liable for any fluctuation of the price of the securities. No express or implied warranty is given as to future performance. The opinions expressed reflect an objective evaluation of information available to the general public, such as rates from customary sources of financial information. The market value of securities mentioned may vary on the basis of economic, financial or political changes, the remaining term, market conditions, the volatility and solvency of the issuer or the benchmark issuer. Moreover, exchange rates may have a positive or negative effect on the value, the price or the income of the securities or the related investments mentioned in this document. It is also expressly noted that forecasts are not a reliable indicator of future performance, while past performance is not a reliable indicator of future results.

You shall only take investment decisions when you fully understand the relevant financial product and the involved risks. In particular, the relevant product documentation (such as the issuance program, final terms, prospectus, simplified prospectus and key (investor) information document), as well as Appendix 4: Risk Warnings Relating to Trading in Financial Instruments of the Terms and Conditions of Pictet London Branch, shall be read. Structured products are complex financial products and involve a high degree of risk. The value of structured products depends not only on the performance of the underlying asset(s), but also on the credit rating of the issuer. Furthermore, the investor is exposed to the risk of default of the issuer/guarantor.

In respect of any product documentation, including key information documents of

Packaged Retail and Insurance-based Investment Products (“KIDs”), please note that these may change without notice. You should therefore ensure that you review the latest version of them prior to confirming to Pictet London your decision to invest. If you have been provided with a link to access the respective KID/other product document, you should therefore click on the link immediately before confirming to Pictet London Branch your decision to invest, in order to review the most recent version of the respective KID/other product document. If you have not been provided with a link to access the relevant document, or if you are in any doubt as to what the latest version of the respective KID/other product document is, or where it can be found, please ask your usual Pictet London Branch contact.

Pictet London Branch is not the manufacturer of the product(s) and the KID/other product document is provided by a third party. The KID/other product document is obtained from sources believed to be reliable. Pictet London Branch does not make any guarantee or warranty as to the correctness and accuracy of the data contained in the KID/other product document. Pictet London Branch may not be held liable for an investment decision or other transaction made based on reliance on, or use of, the data contained in the KID/other product document.

By subscribing to the product(s) proposed herein, you acknowledge that you have (i) received, in good time, read and understood any relevant documentation linked to the product(s), including, as the case may be, the respective KID/other product document; (ii) taken note of the product(s) restrictions; and (iii) meet the applicable subjective and objective eligibility conditions to invest in the product(s).

Pictet London Branch may, if necessary, rely on these acknowledgements and receive your orders, to transmit them to another professional, or to execute them, according

to the relevant clauses of your mandate, as well as the Terms and Conditions of Pictet London Branch.

The content of this document shall only be read and/or used by its addressee. Any form of reproduction, copying, disclosure, modification and/or publication in any form or by any means whatsoever is not permitted without the prior written consent of Pictet London Branch and no liability whatsoever will be incurred by Pictet London Branch. The addressee of this document agrees to comply with the applicable laws and regulations in the jurisdictions where they use the information provided in this document.

Pictet London Branch is a branch of Bank Pictet & Cie (Europe) AG. Bank Pictet & Cie (Europe) AG is a credit institution incorporated in Germany and registered with the Handelsregister, the German Commercial Register under the no. HRB 131080. Its head office is at Neue Mainzer Str. 1, 60311 Frankfurt am Main, Germany. Bank Pictet & Cie (Europe) AG is authorised and regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht, the German Federal Financial Supervisory Authority (BaFIN)

Pictet London Branch is registered as a UK establishment with Companies House (establishment number BR016925) and its UK establishment office address is Stratton House, 6th Floor, 5 Stratton Street, London W1J 8LA. Authorised by the Prudential Regulation Authority (PRA) and subject to regulation by the Financial Conduct Authority (FCA) and limited regulation by the Prudential Regulation Authority. Details about the extent of our regulation by the Prudential Regulation Authority are available from us on request.

Distributors: Bank Pictet & Cie (Asia) Ltd (“BPCAL”) in Singapore and/or Banque Pictet & Cie SA, Hong Kong Branch (“Pictet HK Branch”) in Hong Kong.

The information, tools and material presented in this document are provided for information purposes only and are not to be used or considered as an offer, an invitation to offer or solicitation to buy, sell or subscribe for any securities, commodities, derivatives, (in respect of Singapore only) futures, or other financial instruments (collectively referred to as “Investments”) or to enter into any legal relations, nor as advice or recommendation with respect to any Investments. This document is intended for general circulation and it is not directed at any particular person. This document does not have regard to the specific investment objectives, financial situation and/or the particular needs of any recipient of this document. Investors should seek independent financial advice regarding the appropriateness of investing in any Investments or adopting any strategies discussed in this document, taking into account the specific investment objectives, financial situation or particular needs of the investor, before making a commitment to invest.

BPCAL/Pictet HK Branch has not taken any steps to ensure that the Investments referred to in this document are suitable for any particular investor, and accepts no fiduciary duties to any investor in this regard, except as required by applicable laws and regulations. Furthermore, BPCAL/Pictet HK Branch makes no representations and gives no advice concerning the appropriate accounting treatment or possible tax consequences of any Investment. Any investor interested in buying or making any Investment should conduct its own investigation and analysis of the Investment and consult with its own professional adviser(s) as to any Investment including the risks involved.

This document is not to be relied upon in substitution for the exercise of independent judgment. The value and income of any Investment mentioned in this document may fall as well rise. The market value may be affected by, amongst other things, changes in economic, financial,

political factors, time to maturity, market conditions and volatility, and the credit quality of any issuer or reference issuer. Furthermore, foreign currency rates of exchange may have a positive or adverse effect on the value, price or income of any Investment mentioned in this document. Accordingly, investors must be willing and able to assume all risks and may receive back less than originally invested.

Past performance should not be taken as an indication or guarantee of future performance and no representation or warranty, expressed or implied, is made by BPCAL/Pictet HK Branch regarding future performance.

This document does not constitute the investment policy of BPCAL/Pictet HK Branch, or an investment recommendation, and merely contains the different assumptions, views and analytical methods of the analysts who prepared them. Furthermore, the information, opinions and estimates expressed herein reflect a judgment at its original date of publication and are subject to change without notice and without any obligation on BPCAL/Pictet HK Branch to update any of them. BPCAL/Pictet HK Branch may have issued or distributed other reports or documents that are inconsistent with, and reach different conclusions from, the information presented in this document.

While the information and opinions presented herein are from sources believed to be reliable, BPCAL/Pictet HK Branch is not able to, and do not make any representation or warranty as to its accuracy or completeness. Accordingly, BPCAL/Pictet HK Branch accepts no liability for loss arising from the use of or reliance on this document presented for information purposes only. BPCAL/Pictet HK Branch reserves the right to act upon or use any of the information in this document at any time, including before its publication herein.

BPCAL/Pictet HK Branch and its affiliates (or employees thereof) may or may not have long or short positions in, and buy or sell, or otherwise have

interest in, any of the Investments mentioned herein, and may or may not have relationships with the issuers of or entities connected with Investments mentioned in this document. BPCAL/Pictet HK Branch and their affiliates (or employees thereof) may act inconsistently with the information and/or opinions presented in this document.

The information used to prepare this document and/or any part of such information, may have been provided or circulated to employees and/or one or more clients of BPCAL/Pictet HK Branch before this document was received by you and such information may have been acted upon by such recipients or by BPCAL/Pictet HK Branch.

This document is provided solely for the information of the intended recipient only and should not be reproduced, published, circulated or disclosed in whole or in part to any other person without the prior written consent of BPCAL/Pictet HK Branch.

Singapore

This document is not directed to, or intended for distribution, publication to or use by, persons who are not accredited investors, expert investors or institutional investors as defined in section 4A of the Securities and Futures Act 2001 ("SFA") or any person or entity who is a citizen or resident of or located in any locality, state, country or other jurisdiction where such distribution, publication, availability or use would be contrary to law or regulation or would subject BPCAL and any of its affiliates or related corporations to any prospectus or registration requirements.

BPCAL is a wholesale bank regulated by the Monetary Authority of Singapore ("MAS") under the Banking Act 1970 of Singapore, an exempt financial adviser under the Financial Advisers Act 2001 of Singapore ("FAA") and an exempt capital markets licence holder under the SFA. Please contact BPCAL in Singapore in respect of any matters arising from, or in connection with this document.

Hong Kong

This document is not directed to, or intended for distribution, publication to or use by, persons who are not "professional investors" within the meaning of the Securities and Futures Ordinance (Chapter 571 of the Laws of Hong Kong) and any rules made thereunder (the "SFO") or any person or entity who is a citizen or resident of or located in any locality, state, country or other jurisdiction where such distribution, publication, availability or use would be contrary to law or regulation or would subject Pictet HK Branch and any of its affiliates or related corporations to any prospectus or registration requirements. If you do not want Pictet HK Branch to use your personal information for marketing purposes, you can request Pictet HK Branch to stop doing so without incurring any charge to you.

In distributing an investment product as agent for a third party service provider, Pictet HK Branch distributes the product for the third party service provider and the product is a product of the third party service provider but not Pictet HK Branch. In respect of an eligible dispute (as defined in the Terms of Reference for the Financial Dispute Resolution Centre in relation to the Financial Dispute Resolution Scheme) arising between Pictet HK Branch and you out of the selling process or processing of the related transaction, Pictet HK Branch is required to enter into a Financial Dispute Resolution Scheme process with you; however any dispute over the contractual terms of the product should be resolved directly between the third party service provider and you.

Banque Pictet & Cie SA is a limited liability company incorporated in Switzerland. It is an authorized institution within the meaning of the Banking Ordinance and a registered institution (CE No.: BMG891) under the SFO carrying on Type 1 (dealing in securities), Type 4 (advising on securities) and Type 9 (asset

management) regulated activities. The registered address of Pictet HK Branch is 9/F., Chater House, 8 Connaught Road Central, Hong Kong.

Warning: The contents of this document have not been reviewed by any regulatory authority in Hong Kong. You are advised to exercise caution in relation to the offer. If you are in any doubt about any of the contents of this document, you should obtain independent professional advice. Please contact Pictet HK Branch in Hong Kong in respect of any matters arising from, or in connection with this document.