

Leveraged buyout

Private market education

Karim Cherif, Head Alternative Investments, UBS Switzerland AG; Antoinette Zuidweg, Alternative Investments Strategist, UBS Switzerland AG; Jennifer Liu, Private Markets Strategist, UBS Financial Services Inc. (UBS FS)

This primer provides an overview of leveraged buyout and covers the strategy basics, manager value-add, performance, and benefits in an investor's portfolio.



Leveraged buyout is the largest segment of private market strategies, as measured by assets under management.



Buyout managers utilize leverage to take a controlling position in mature companies with the aim of growing earnings through value-add initiatives.



Success in value-add initiatives typically drives return premiums above public markets over a long time horizon.

Summary

- The aim of leveraged buyout (LBO) investing is to use leverage to purchase a controlling interest in a company with the intention to improve profitability and exit at a higher multiple.
- Target firms are typically mature companies late in their lifecycle with predictable cash flows.
- Buyout managers focus on enacting transformational change. Successful execution of these programs can improve earnings growth and exit opportunities.
- Potential sources of value-add include optimizing revenue growth, expanding margins, employing leverage, sale of non-core businesses, and management overhaul.
- Typical exit avenues include sale to a strategic partner, to another buyout fund, or through a public listing.
- Buyout delivered a median 16.2% pooled vintage year internal rate of return (IRR) and 1.9x total value to paid-in (TVPI) multiple over the 1993–2019 period. The standard deviation of vintage year IRR was 5.2% and 0.3x on a TVPI basis.
- Buyout strategies outperformed public markets by more than 869 bps when observing MSCI ACWI public market equivalent (PME) returns for funds launched between 1993–2019.
- Buyout returns are generally linked to economic cycles, with valuations, earnings growth, credit availability, and dry powder all influencers of returns.
- While returns are generally linked to equity markets, buyout funds expand investors' universe with exposure to active control transactions where fund managers have the flexibility to implement company-specific long-term change, some of which may not be macro dependent.
- With significant differences in manager performance, key risks to leveraged buyouts include leverage, operational execution, and exit timing. Other, more general private market risks also apply, including significant illiquidity of fund vehicles, limited control, and high fees.

This report is part of a series of short primers on specific private market strategies. For a deeper understanding of private markets, please read our [Introduction to Private Markets](#). Find more information on the client portal or contact your advisor for assistance.



16.2%

Median pooled IRR



~869 bps

Median annualized IRR outperformance vs. public markets



1.9 x

Median pooled TVPI (total value to paid in) multiple



-1.2%

Lower quartile IRR*



32.5%

Upper quartile IRR*



0.39

Correlation to public markets

Source: Based on historical data for funds launched between vintage years 1993-2019 using Cambridge Associates data, UBS estimates. *Quartile IRR's reflect minimum and maximum value across vintage years. Note: Given most funds take a few years for performance to settle, performance of recent vintage years may be less meaningful. Internal rates of returns are net of fees, expenses, and carried interest. Data as of November 2023.

What does the leveraged buyout strategy do?

Leveraged buyout (LBO) is the most active private equity strategy by assets under management (AUM) and the one most familiar to investors (figure 1). LBO investing uses leverage to purchase a controlling interest in a company with the intention to improve profitability and exit at a higher multiple.

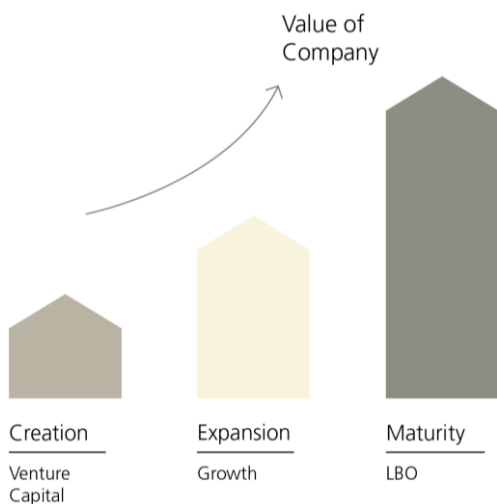
Target LBO investments

- Target firms are typically mature companies late in their lifecycle with predictable cash flows, tangible assets, and limited capital expenditures or working capital requirements (figure 1).
- Target firms can be private, public, state-owned, spin-offs, family businesses, or secondary buyout companies from other private equity firms.
- Sector expertise is critical both at the macro level to identify underappreciated market areas, and at the micro level to find individual companies that offer better investment opportunities.
- Once a target is identified, sponsors carry out a purchase price analysis using assumptions about comparable valuations, leverage levels, and the potential future exit value of the investment.
- Buyout portfolios tend to be more concentrated (between 10 and 15 companies) compared to other strategies.

Leverage, holding period, and exit

- Overall, returns are driven by leverage, multiple expansion, and earnings growth. Earnings growth is a critical driver as it can influence both a higher exit multiple and the ability to pay down debt.
- Debt is usually tranching between senior and junior debt, and is sourced from banks, institutions, or private debt funds.
- Leverage levels typically range between 50% and 75%. Assets and cash flows are used as collateral.
- The holding period for a particular investment can range from 2–5 years, with the total fund duration typically 10 years with two one-year extensions.
- During the holding period, macro dynamics as well as operational value-add projects (covered in the next section) can influence earnings.
- Sponsors have three main avenues to exit investments: trade sale to a strategic partner (i.e., a firm in a similar line of business), secondary buyout (i.e., sale to another LBO fund), or via a public listing.
- LBO firms typically favor trade sales as they can help speed up the exit process given familiarity of the business, and achieve higher exit valuations due to perceived synergies.

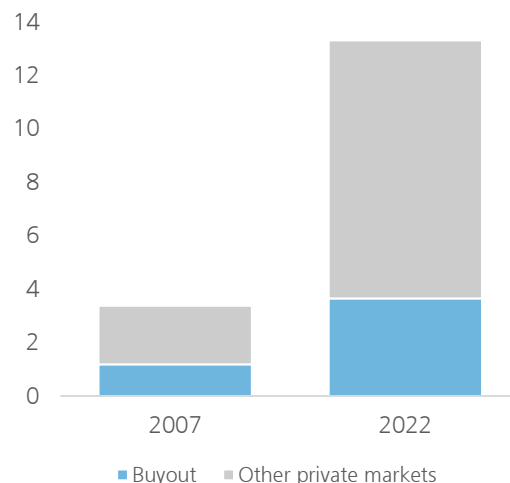
Fig. 1: Investing in a company's life cycle
Buyout investors typically seek to invest in mature businesses



Source: UBS

Fig. 2: The private market industry has grown rapidly in the last decade

With over USD 3.5tn, leveraged buyout represents about 30% of total private markets AUM



Source: Pitchbook, UBS, November 2023

Sources of value add

By utilizing their operating experience and network of executive professionals, buyout funds seek to add value for investors by sourcing and enacting transformational change through control positions in mature companies.

- Improving revenue growth: Buyout managers look to uncover underperforming businesses and improve existing ones. Levers include price increases, entering adjacent and underserved markets, and refocusing product development.
- Expand margins: Buyout managers that excel in implementing lean operations can drive earnings growth that is less dependent on the macro environment. Improved procurement practices, supply chain management, and capacity utilization are examples used to expand gross margins. Eliminating redundant administrative functions can further reduce common costs across portfolio companies.
- Sale of non-core businesses: Buyout managers can shed non-core assets to refocus management toward primary businesses. Proceeds may be used to pay down debt to further increase equity value.
- Sourcing proprietary deals: Buyout funds with extensive sourcing capabilities and a pipeline of proprietary deal flow can improve deal speed and quality versus relying on a competitive auction process.
- Optimizing capital structure: Successful buyout managers can skillfully deploy or reduce leverage to optimize capital structure and enhance returns, using ongoing cash flows to pay down debt and increase equity value.
- Management overhaul: Buyout managers may overhaul existing management teams by utilizing their network of executive professionals to source talent.
- Managing exit process: Buyout managers need to adeptly assess the timing and exit method to maximize realized gains.

Performance analysis

Introduction to vintage year returns

- Private market returns are assessed using the vintage year, the year in which the first influx of capital is delivered to a project or a company. For example, if hypothetical fund ABC reported vintage year 2005 IRR of 15%, ABC was inceptioned in 2005 and the IRR reflects all investment activity performed over the course of its lifecycle: contributions and distributions made in 2005, 2006, 2007, etc., until the end of the fund.
- If hypothetical fund XYZ reported vintage year 2008 TVPI of 1.3x, the fund returned USD 1.30 for every USD 1 invested through the duration of the fund's life (2008–2018).

Table 1: Median pooled performance for vintage years 1993–2019

| | Global Buyout | Global Growth Equity | US Venture Capital |
|-----------------------|---------------|----------------------|--------------------|
| Median Pooled IRR (%) | 16.2 | 14.0 | 18.7 |
| Std Deviation IRR (%) | 5.2 | 9.4 | 28.2 |
| Median Pooled TVPI | 1.9x | 1.9x | 2.1x |
| Std Deviation TVPI | 0.3x | 0.6x | 1.4x |

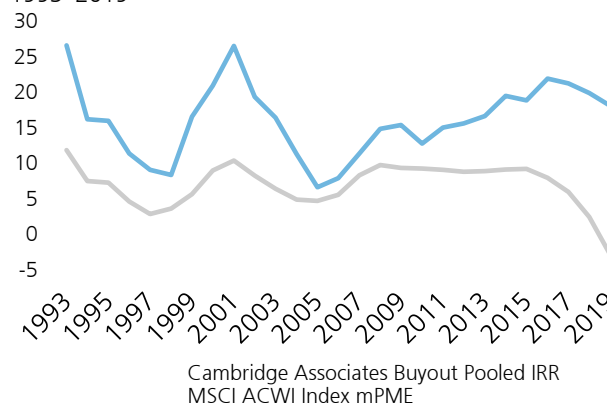
Source: Cambridge Associates, UBS, November 2023

Historical performance and comparisons versus public market returns

- Using Cambridge Associates data, buyout delivered a median 16.2% pooled vintage year IRR and 1.9x TVPI for funds launched between 1993–2019 (table 1).
- The standard deviation of vintage year IRR was 5.2% and 0.3x on a TVPI basis between 1993–2019.
- Global buyout strategies outperformed public markets when observing PME (public market equivalent) returns. With the median MSCI ACWI PME of 7.9%, buyout outperformed global listed equities by over 869 bps per year over the 1993–2019 period (figure 3).
- Buyout returns have consistently outperformed the MSCI ACWI PME in all 27 vintage years observed, indicating a durable return premium historically.
- We observe significant differences in lower quartile versus upper quartile returns, indicating elevated dispersion between fund managers and highlighting the importance of manager due diligence (figure 4).

Fig. 3: Buyout pooled IRR vs. MSCI ACWI PME

Buyout has outperformed public markets across vintage years 1993–2019



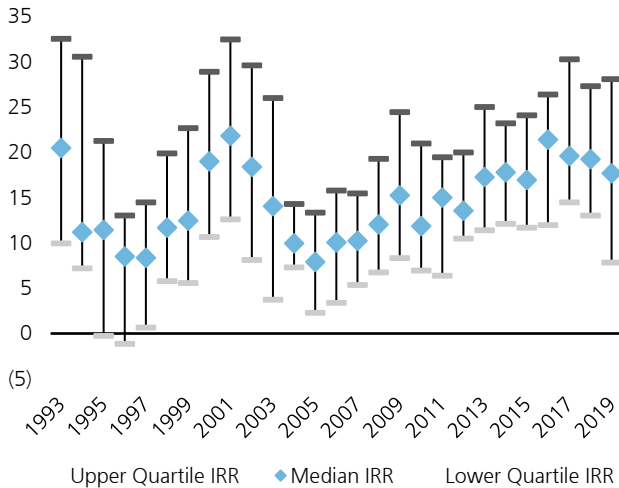
Source: Cambridge Associates, UBS, November 2023

How do Buyout returns compare versus other private equity strategies?

- Buyout strategies generated attractive median IRR compared to growth equity yet lower than venture capital strategies, with TVPI multiples lower than that of growth equity and venture strategies (table 1).
- Buyout funds target mature companies with recurring cash flows. As a result, buyout returns exhibit lower variability versus other private equity strategies when observing the standard deviation in IRR and TVPI multiples.
- Per vintage year, buyout funds also show fewer outliers compared to growth equity and venture capital.

Fig. 4: LBO return dispersion per vintage year between 1993–2019

High level of dispersions within each vintage year show importance of manager selection



Source: Cambridge Associates, UBS, November 2023

Leveraged buyout and the business cycle

- Buyout returns are generally linked to economic cycles, with valuations, earnings growth, credit availability, and dry powder all influencing returns.
- The IPO and M&A environment can affect exit opportunities for buyout managers.
- Buyout returns stand out soon after public market peaks (2001 and 2009 vintages). These periods exhibited lower purchase price multiples, cost of capital, and competition for deal flow.
- Buyout returns were the lowest a few years before the dot-com bubble (1998 vintage) and global financial crisis (2005 vintage). These periods exhibited higher purchase price multiples, higher cost of capital, and heightened competition for deal flow.
- Buyout managers have fared well versus public markets before and during prior market peaks.

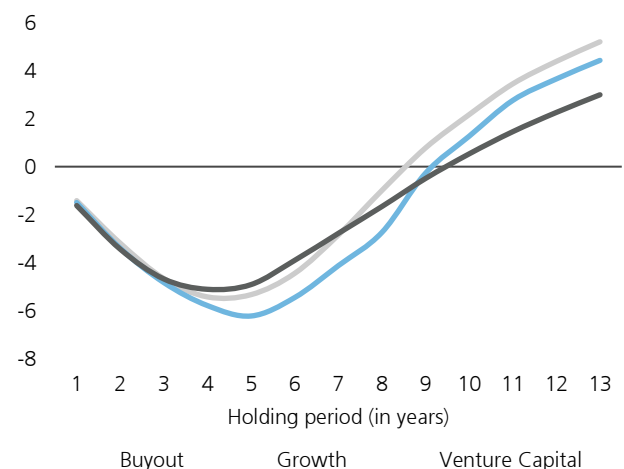
- When observing performance before the financial crisis, buyout returns in 2006–2007 vintage years outperformed the MSCI ACWI PME by around 268bps. Additionally, before the dot-com bubble in 1999–2000, these vintage years outperformed the MSCI ACWI PME by around 1,143bps.
- When observing performance during the financial crisis, buyout returns in the 2008 vintage year outperformed the MSCI ACWI PME by near 513bps. Additionally, during the dot-com bubble in 2001–2002, these vintage years outperformed the MSCI ACWI PME by some 1,362bps.

Buyout in your portfolio

- Buyout funds can add differentiated sources of return as they expand investors' universe with exposure to managers that have flexibility to implement company-specific, long-term change. These changes may or may not be linked to the economic environment.
- Buyout funds can earn a premium above public market returns for providing long-term capital, enabling this active approach to sourcing, executing, and managing control equity investments.
- Buyout funds are longer-term investments that can take 8–9 years to break even when measuring historical cash flows. This duration is about a year shorter than that of growth equity and venture capital funds, as those strategies invest in earlier-stage companies that could take longer to develop and realize value (figure 5).

Fig. 5: Cumulative net cash flows of various private equity strategies (“J” curve)

Buyout strategies typically first to break even versus other PE strategies



Source: Pitchbook, UBS. Figures normalized to USD 10m commitment.

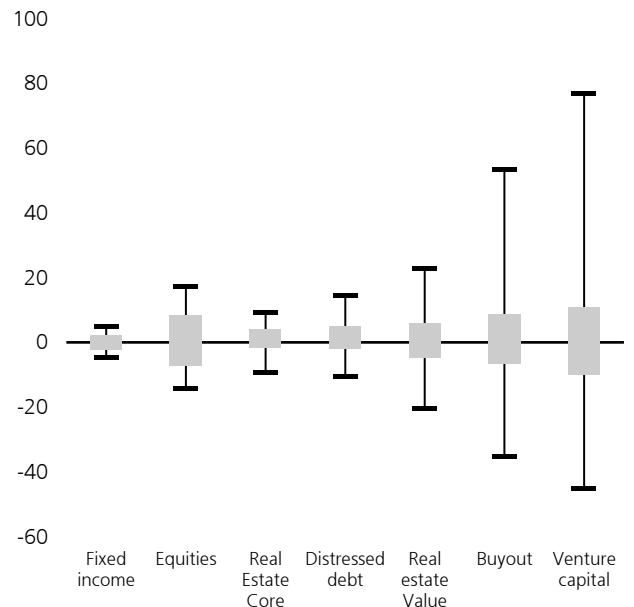
Risks

- Risks of investing in buyout funds include blind pool structure, potential for unwanted or unintended sector risks or concentration, and competition for investment opportunities from strategic buyers and other buyout firms.
- Given the complex nature of pooling together financial, business, and managerial resources, there are execution risks in enacting transformational change.
- Ability of private equity funds to exit portfolio company investments and return capital to investors is dependent on prevailing equity market conditions.
- Performance can differ greatly among managers (figure 6), which can be mitigated through strict manager selection.
- Other, more general private market risks also apply, including significant illiquidity of fund vehicles, limited control, disclosure, and transparency on underlying holdings, and high fees. These risks cannot be fully eliminated, but can be reduced through extensive institutional due diligence and rigorous investment and monitoring processes.



Fig. 6: Public vs. private manager fund returns

Similar to other private equity strategies, buyout exhibits higher dispersion compared to traditional markets (%)



Source: Pitchbook, Bloomberg, UBS. Dispersion of fund returns relative to median performance. Data references 1995-2018 for private market funds, 1995-2021 for traditional equity and fixed income funds. Data as of November 2023.

Appendix

Selected definitions

- **Correlation:** the degree to which the fluctuations of one variable are similar to those of another.
- **Leverage:** the use of borrowed capital or instruments to increase the potential return (but also potential losses) of an investment, a simple example is a mortgage used in real estate transactions.
- **Leveraged buyout funds:** a private equity strategy using borrowed capital to gain control of a company.
- **Illiquidity premia:** the premium that an investor can demand depending on how difficult it is to convert the underlying security can be converted to cash.
- **Multiples:** a term that measures some aspect of a company's financial well-being, determined by dividing one metric by another metric. The metric in the numerator is typically larger than the one in the denominator, because the top metric is usually supposed to be many times larger than the bottom metric.
- **Multiple expansion:** describes the way a particular valuation metric increases to reflect a higher value assigned to an underlying investment.
- **Value add:** describes the operational, business, or structural improvements private market managers seek through underlying portfolio investments.
- **Cash flows:** cash flow is the net amount of cash and cash-equivalents being transferred into and out of a fund.
- **Public Market Equivalent (PME):** a method that converts public market returns to a benchmark that can be compared to private market returns.
- **IRR:** a return method used to evaluate private market investments and reflects the discount rate at which the present value of an investment's future cash flow equals the cost of the investment.
- **TVPI (Total Value to Paid In):** a return metric that describes the total capital distributed back to the investor + residual value left in the fund divided by invested capital.
- **Exit:** the time period in which an investor can convert holdings into cash to be liquidated over a designated period of time.
- **IPO:** the first sale of stock by a private company to the public. Also referred to as an "initial public offering."
- **Standard deviation:** a measure of the degree to which individual values vary from the distribution mean. The higher the number, the greater the risk.
- **Dry powder:** refers to cash reserves kept on hand by a private markets firm to cover future obligations, purchase assets or make acquisitions.
- **J-curve:** illustrates a period of initial negative cash flows (contributions) towards positive cash flows (distributions back to the investor) over a period of time.
- **Sponsor:** the general partner in a limited partnership who organizes and signs up investors.
- **Secondary buyout:** describes a sale between private market firms
- **Trade sale/strategic sale:** describes a sale of a business to another business operating in a similar industry.
- **Senior debt:** loans or debt securities that have claim prior to junior obligations and equity on a corporation's assets in the event of liquidation.
- **Junior debt:** loan or security that ranks below other loans or securities with regard to claims on assets or earnings. In the case of borrower default, creditors who own subordinated debt won't be paid out until after senior debt holders are paid in full.
- **Vintage year:** is the year in which the first influx of investment capital is delivered to a project or company. This marks when capital is contributed by venture capital, a private equity fund or a partnership drawing down from its investors.
- **M&A:** mergers and acquisitions is a general term that refers to the consolidation of companies or assets through various types of financial transactions. M&A can include a number of different

transactions, such as mergers, acquisitions, consolidations, tender offers, purchase of assets and management acquisitions.

- **Blind pool:** money collected from several people which is put into a fund and invested for their profit. It is left unspecified which properties are to be acquired.
- **Unit economics:** a measure of direct revenues and costs on a unit basis for a particular business model.
- **Minority stake:** reflects a non-controlling interest that is less than 50% of a particular entity.
- **Spin off:** describes the separation of an independent company from a larger parent.
- **Control provisions:** designed to provide a level of influence over significant operational and business matters.
- **Redemption rights:** gives investors the right to force a company to repurchase their shares after a period of time.
- **Idiosyncratic risk:** risk associated with a narrow set of factors pertaining to a particular company. Risk that has little association with overall market risk.
- **Tag-along provisions:** provides a minority shareholder the right to join in on a sale of a company that is initiated by a majority shareholder.

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.

Risk information

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"), part of UBS Group AG ("UBS Group"). UBS Group includes Credit Suisse AG, its subsidiaries, branches and affiliates. Additional disclaimer relevant to Credit Suisse Wealth Management follows at the end of this section. 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.

Different areas, groups, and personnel within UBS Group may produce and distribute separate research products **independently of each other**. For example, research publications from **CIO** are produced by UBS Global Wealth Management. **UBS Global Research** is produced by UBS Investment Bank. **Research methodologies and rating systems of each separate research organization may differ**, for example, in terms of investment recommendations, investment horizon, model assumptions, and valuation methods. As a consequence, except for certain economic forecasts (for which UBS CIO and UBS Global Research may collaborate), investment recommendations, ratings, price targets, and valuations provided by each of the separate research organizations may be different, or inconsistent. You should refer to each relevant research product for the details as to their methodologies and rating system. Not all clients may have access to all products from every organization. Each research product is subject to the policies and procedures of the organization that produces it.

The compensation of the analyst(s) who prepared this report is determined exclusively by research management and senior management ([not including investment banking](#)). Analyst compensation is not based on investment banking, sales and trading or principal trading revenues, however, compensation may relate to the revenues of UBS Group as a whole, of which investment banking, sales and trading and principal trading are a part.

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-methodology. 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 approach ESG analysis and incorporate the findings in a variety of ways. Incorporating ESG factors or Sustainable Investing considerations may inhibit UBS's ability to participate in or to advise on certain investment opportunities that otherwise would be consistent with the Client's investment objectives. The returns on a portfolio incorporating ESG factors or Sustainable Investing considerations may be lower or higher than portfolios where ESG factors, exclusions, or other sustainability issues are not considered by UBS, and the investment opportunities available to such portfolios may differ.

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.

USA: Distributed to US persons only 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 Mobiliarios Ltda, UBS Asesores Mexico, S.A. de C.V., UBS SuMi TRUST Wealth Management Co., Ltd., UBS Wealth Management Israel Ltd and UBS Menkul Degerler AS are affiliates of UBS AG. **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**

For country information, please visit ubs.com/cio-country-disclaimer-gr or ask your client advisor for the full disclaimer.

Additional Disclaimer relevant to Credit Suisse Wealth Management

You receive this document in your capacity as a client of Credit Suisse Wealth Management. Your personal data will be processed in accordance with the Credit Suisse privacy statement accessible at your domicile through the official Credit Suisse website <https://www.credit-suisse.com>. In order to provide you with marketing materials concerning our products and services, UBS Group AG and its subsidiaries may process your basic personal data (i.e. contact details such as name, e-mail address) until you notify us that you no longer wish to receive them. You can optout from receiving these materials at any time by informing your Relationship Manager.

Except as otherwise specified herein and/or depending on the local Credit Suisse entity from which you are receiving this report, this report is distributed by Credit Suisse AG, authorised and regulated by the Swiss Financial Market Supervisory Authority (FINMA). Credit Suisse AG is a UBS Group company.

Version D/2023. CIO82652744

© UBS 2023. The key symbol and UBS are among the registered and unregistered trademarks of UBS. All rights reserved.