KROLL

# Goodwill Impairment Testing in a Volatile Environment

## Perspectives from U.S. GAAP and IFRS

7 December 2022

# Table of Contents

# Stay Ahead with KROLL

## Data, technology and insights for risk, governance and growth

**One Team, One Kroll.**
Your preferred partner for all your complex global demands.

With over **6,000 experts** around the world, we create value and impact for our clients and communities.

- Valuation
- Compliance and Regulation
- Corporate Finance and Restructuring
- Cyber Risk
- Environmental, Social and Governance
- Investigations and Disputes
- Business Services

# Our Evolution

## In Operation for Nearly 100 Years

### STORIED BRAND
**1932-2004**

- Duff & Phelps founded as investment research firm

### NEW FIRM, EXPANDING CAPABILITIES
**2005-2020**

- Started as valuation and corporate finance advisor
- Rapid growth into other governance, risk, compliance and complementary solutions
- Acquired 30+ businesses, including Kroll in 2018

### ONE TEAM, ONE KROLL
**2021-2022**

- Duff & Phelps rebrands as Kroll and completes brand unification
- Full business life cycle capabilities across risk, governance and growth
- Serving clients in 140 markets across nearly every industry and sector

# Valuation Advisory Highlights

**World's Leading Independent Valuation Provider**

**1,427**

**Professionals**

including 160 Managing Directors, dedicated to Valuation Advisory

In 2021 we performed over **10,667** engagements for more than **3,618** clients

## Kroll professionals:

- Serve on AICPA task forces including: Business Combinations, Goodwill Impairment (Co-Chair) and Private Equity/Venture Capital
- Appointed to The Appraisal Foundation's Appraisal Practices Board
- Principal drafter of U.S. Private Equity Valuation Guidelines
- Provided public commentary to the OECD on base erosion and profit shifting action items impacting transfer pricing
- Served as panelists on IFRS and mark-to-market SEC roundtables
- Appointed to the International Valuation Professional Board by the International Valuation Standards Council (IVSC)
- Numerous involvement in IVSC Boards: Member of the IVSC Business Valuation Board, Financial Instruments Board, Tangible Assets Board, Standards Review Board and IVSC Europe Board
- Participant on the EFRAG Advisory Panel on Intangibles

# Greg Franceschi

**Managing Director,**
**Valuation Advisory Services**

Kroll

Silicon Valley

+1 650 798 5570

Greg.Franceschi@kroll.com

Greg Franceschi is a Managing Director in the Silicon Valley office and the Global Leader of Kroll's Financial Reporting Practice and Office of Professional Practice.

Greg has completed numerous valuation and consulting projects for leading technology, media, consumer products, retail, medical products and industrial product companies. In addition, Greg has been engaged as an expert witness in valuation related matters.

Before its merger with Duff & Phelps, Greg was a managing director at Standard & Poor's. Prior to that, Greg was a partner at PricewaterhouseCoopers LLC.

Greg received his M.B.A. in finance from the University of Notre Dame and his B.S.in economics from Indiana University. He is an American Society of Appraisers candidate, having completed all testing requirements. Greg is also a member of the D&P Technical Committee and member of the American Institute of Certified Public Accountants (previously licensed in the State of Illinois).

Greg was Co-Chairman of the AICPA Impairment Task Force (publishing the AICPA Accounting and Valuation Guide - Testing Goodwill For Impairment) and has been widely quoted on ASC 350 matters.

# Carla S. Nunes, CFA, ABV

## Managing Director

**Carla S. Nunes** is a Managing Director in the Office of Professional Practice of Kroll (previously Duff & Phelps). She has over 25 years of experience. In that role, Carla provides firm-wide technical guidance on a variety of valuation, financial reporting and tax issues. She also co-authors Kroll's annual U.S. and European Goodwill Impairment Studies. In addition, Carla is the Global Leader of Kroll's Valuation Digital Solutions group, which produces cost of capital thought leadership content and data housed in the Cost of Capital Navigator.

- In 2011, Carla completed a one-year rotation in Kroll's London office, where she promoted the firm's IFRS education efforts and marketing initiatives, as well dealing with IFRS implementation issues.
- Prior to this role, Carla was part of the Valuation Advisory Services business unit, performing engagements primarily for financial reporting and tax purposes at Kroll's predecessor firms, PricewaterhouseCoopers, Standard & Poor's, and Duff & Phelps.
- Carla has conducted numerous business and asset valuations for a variety of purposes, including purchase price allocations, goodwill impairment testing, M&A, corporate tax restructuring and debt analysis. She has been involved in multiple valuation assignments for a wide range of industries, including pharma & biotech, healthcare, vitamin retail, specialty chemicals, industrial manufacturing and gaming & hospitality. Carla has substantial experience with cross-border valuations, working with multinational corporations to address complex tax, international cost of capital and foreign exchange issues.
- Carla is one of Kroll's experts addressing valuation issues related to cost of capital. She is a co-author of the "Valuation Handbook" series and is a co-creator of the Kroll Cost of Capital Navigator. Carla is a frequent speaker in webinars and conferences on the topics of cost of capital, goodwill impairment and valuation in general.
- Carla is a Kroll Institute Fellow, a Practitioner Director in the Board of the Financial Management Association (FMA) International, and a member of the Education Committee of the International Institute of Business Valuers (iiBV).
- Carla received her M.B.A. in finance from the University of Rochester's Simon School, an honors degree is busines administration from Lisbon's School of Economics and Management (ISEG Lisbon) and completed coursework for a Masters of Taxation from Villanova University School of Law. Additionally, she holds a Chartered Financial Analyst (CFA) designation, an Accredited in Business Valuation (ABV) credential, and has passed the exam and fulfilled all the requirements for the Certified in Entity and Intangibles Valuations (CEIV) credential.

# James Palmer

**Managing Director**
**Valuation Advisory Services**

London

+44 20 7089 4827

james.palmer@kroll.com

James Palmer is a Managing Director in the London office of Kroll (formerly Duff & Phelps) and is part of the Valuation Advisory Services business unit. James joined Kroll in 2004 and has over 20 years of valuation experience.

James has extensive experience in performing valuations of business enterprises, debt instruments, equity securities and intangible assets. These valuations are for the purpose of assisting clients in tax & financial planning & reporting, transaction advisory support, strategic planning & litigation support and portfolio valuation support for the alternative asset industry. James has experience in acting as an expert witness and has spoken on a wide variety of valuation related topics, including the Valuation of Intangible Assets, the Practical Implementation of IFRS 3 and Valuation in Accordance with the IPEV Guidelines.

James has given expert testimony and been cross examined in both court and arbitration proceedings.

Prior to joining Kroll, James qualified as a Chartered Accountant in the consumer products practice of PricewaterhouseCoopers in London.

James received his MEng. in mechanical engineering from Cambridge University. He is a Chartered Accountant with the Institute of Chartered Accountants in England and Wales and is a member of and former Chairman of the ICAEWs Valuation Community.

# Gary Raichart

**Managing Director**
**Strategic Value Advisory**

San Diego / Silicon Valley
+1 650 798 5586
gary.raichart@kroll.com

Gary Raichart is a managing director in the Strategic Value Advisory practice at Kroll (formerly known as Duff & Phelps), based out of San Diego. He has over 15 years of consulting experience focusing on the strategic analysis of value, risk and uncertainty. He has extensive experience valuing assets and liabilities, business opportunities, contractual obligations, and transactions that involve substantial uncertainty, including early-stage intellectual property (IP), patent portfolios, guarantees, warranty obligations, employee stock options, earn-outs, and other contingent assets and liabilities for strategic decision-making, collateral, financial reporting and tax purposes.

Gary served as a subject matter expert on The Appraisal Foundations' Working Group on the valuation of contingent consideration. He has estimated the fair value of hundreds of contingent consideration arrangements in industries spanning high tech, life sciences, industrial products, energy and mining, consumer products, entertainment and financial services. Additionally, Gary led the development of the model used to project future professional golfers' performance and endorsements as part of Kroll's annual Future Career Value Study.

Gary has also developed financial projections for new product launch decisions, strategy evaluation, IP strategy analysis, and R&D investment prioritization, and vetted financial projections for both buy-side and sell-side commercial due diligence. He has vast experience in building mathematical models and using statistical analysis to help clients understand the effects of uncertainty and its impact on value. Gary's experience also includes numerous fiscal and economic impact analyses to quantify the benefits of business development, assist in facility relocation decisions, and support negotiation of state and local fiscal incentives. He has provided litigation support services for patent and commercial matters based on primary market research, statistical analysis, econometric modeling, and "what if" scenario analysis. He has performed market strategy analysis by measuring customer preferences and developing market models to predict choice and market penetration of new offerings and to support market segmentation. Additionally, Gary has developed a macroeconomic model used to predict IT spend worldwide by industry, geography and company size on a quarterly basis.

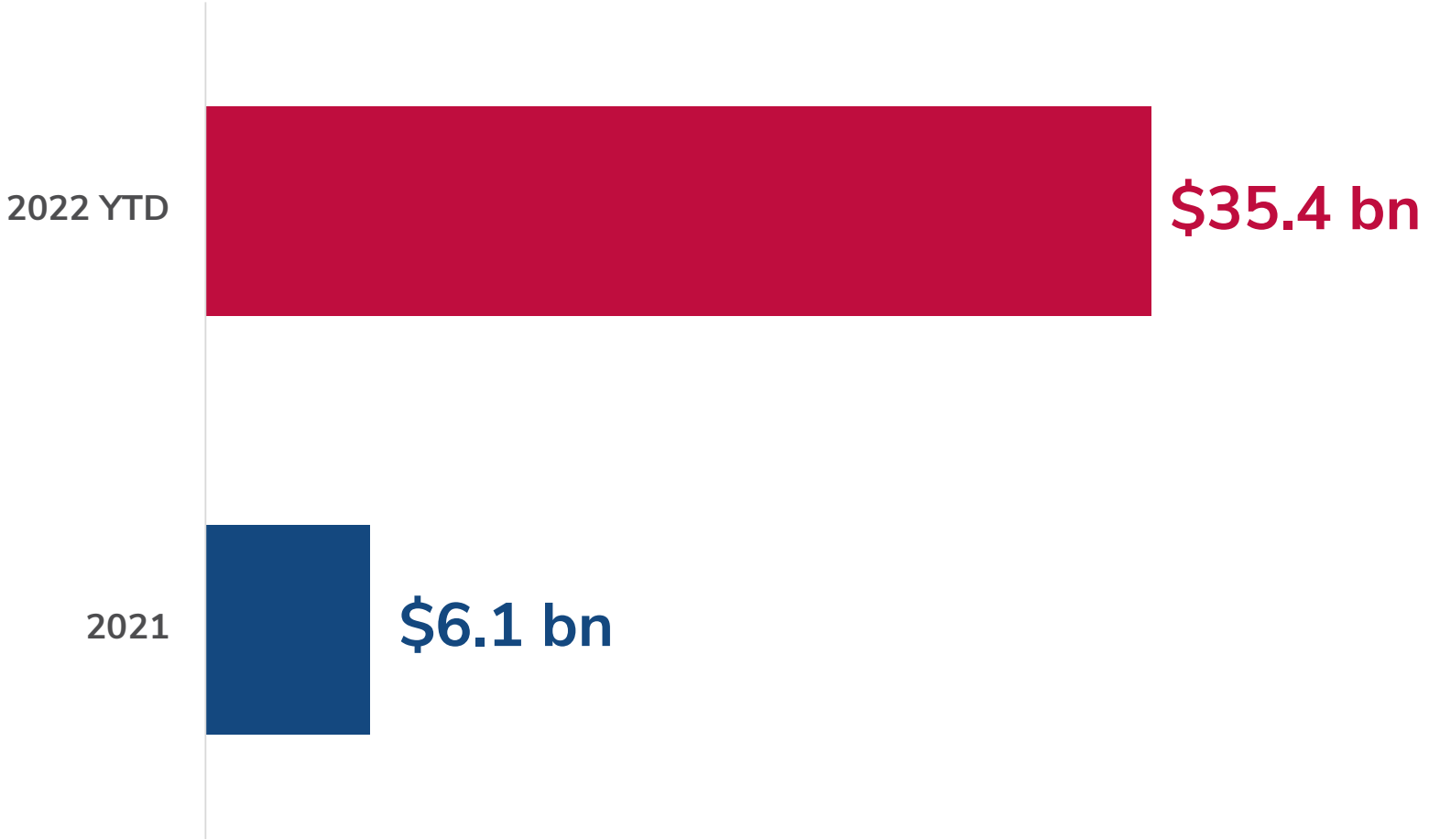
Gary received an MS in management science and engineering and a BS in mathematical and computational science with honors and distinction from Stanford University.

# 2. Goodwill Impairment Trends in 2022

KROLL

# 2021 vs YTD 2022 Top 10 Goodwill Impairments – United States

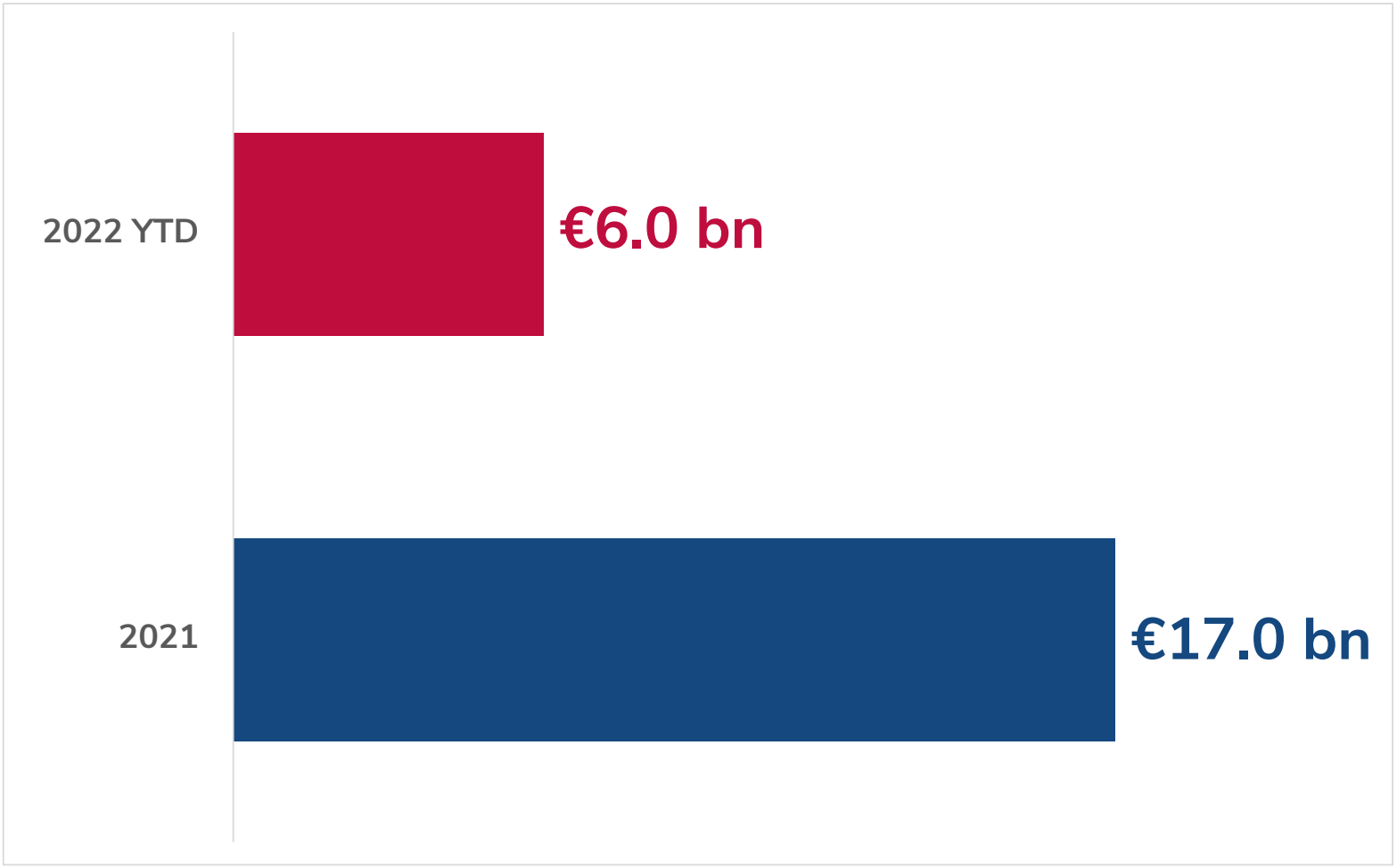
(U.S. Dollars in Billions)




Access historical Kroll's Goodwill Impairment Studies covering the U.S., Europe, and Canada, by visiting:
https://www.kroll.com/en/insights/publications/goodwill-impairment

# 2021 vs YTD 2022 Top 10 Goodwill Impairments – STOXX Europe 600

(Euros in Billions)




Access historical Kroll's Goodwill Impairment Studies covering the U.S., Europe, and Canada, by visiting:
https://www.kroll.com/en/insights/publications/goodwill-impairment

# Common Reasons Provided for 2022 Impairments

- Market volatility, higher interest rates, and/or higher forecast risk leading to higher discount rates (higher cost of capital)
- Decline in market cap and lower or poor financial performance
- Lower projected operating results due to exchange rate fluctuations, high inflation, and other macroeconomic factors
- Higher energy prices
- Adverse impact of global supply chain disruptions
- Continued challenges in labor markets, including both shortages in workforce and inflationary wage pressures

# S&P 500 (Price) Index (USD)

December 31, 2019 – November 29, 2022

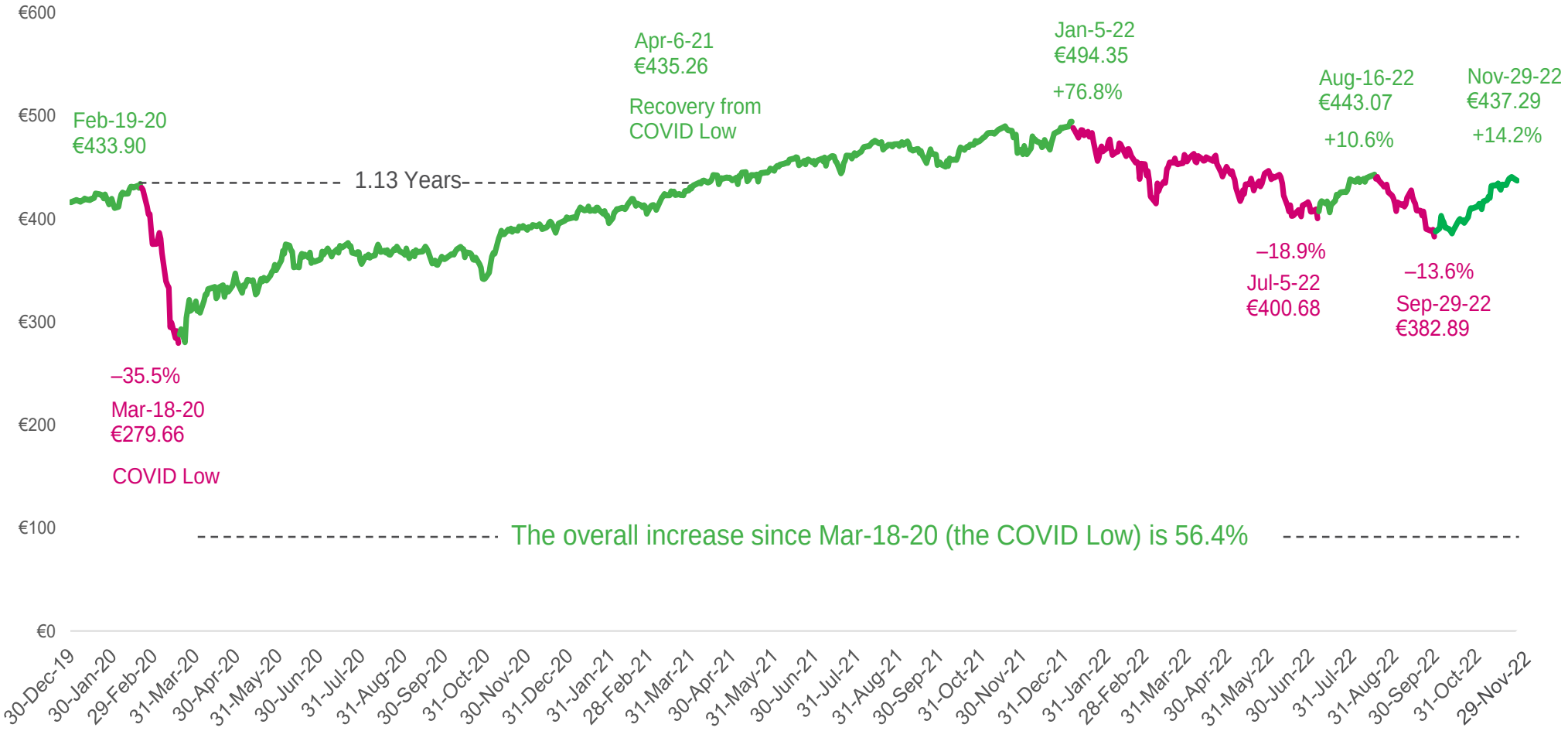

YTD

30 Nov 2022?

-14.4%

# STOXX Europe 600 (Price) Index (EUR)

December 31, 2019 – November 29, 2022




YTD

30 Nov 2022?

-9.8%

# 3. US GAAP / IFRS - Similarities & Differences

KROLL

# Goodwill Impairment Testing

US GAAP and IFRS Similarities and Differences

**Conceptually the same:**

- Goodwill allocated to those Cash Generating Units / Reporting Units that are expected to benefit from the combination
- No amortization
- Tested annually for impairment, or
- More frequently if there is an indicator of impairment

# Goodwill Impairment Testing

US GAAP and IFRS Similarities and Differences

**But with some fundamental differences:**

- Level at which testing is undertaken can differ
  1. Cash generating unit (CGU) (IFRS)
  2. Reporting units (RU) (US GAAP)
- Impairment recorded when carrying value exceeds:
  1. 'Recoverable amount' (IFRS); higher of fair value less costs of disposal and value in use (VIU)
  2. 'Fair value' (US GAAP) but now with qualitative step 0 first
- Allocation of impairment losses:
  1. Goodwill and then other assets in CGU (IFRS)
  2. Goodwill only (US GAAP)
- Impairment losses are never reversed for goodwill (but it can be reversed for other assets under IFRS)

# Impairment Test under IAS 36

**Impairment Exists** If **CGU /Asset Carrying Amount** > **CGU / Asset Recoverable Amount**

## **Recoverable Amount** is the greater of...

**Value in use**

- Present value of the future cash flows expected to be derived from an asset or CGU
- Income approach only
- Reflecting on the internal perspective of company
- True synergy effect between CGUs (even buyer specific) but no future restructuring if not approved by the board
- Guidance in using 5 years of forecast before terminal value
- Discount rate on a pre-tax basis (can be derived from post-tax discount rate through iterative process)

**Fair value less costs of disposal**

- The price that would be received from the sale of an asset or CGU, less costs of disposal
- Both income and market approaches
- Reflecting the external perspective of market in which the company is operating
- Assessment of asset / CGU from perspective of a market participant
- Discount rate based on how market participants price risk (typically on an after-tax basis)

# Goodwill Impairment

Consider for Step 0 under US GAAP and Indications of Impairment under both US GAAP and IFRS

| Indicators | Examples |
|---|---|
| **Macroeconomic conditions** | Cyclical CGU/RU with high exposure to downturn expectations |
| **Industry and market considerations** | CGU/RU with significant exposure to energy input costs, |
| **Cost factors** | High costs/inflation that can't be passed on / High wage inflation |
| **Overall financial performance** | Declining revenue or margins in a CGU/RU after Covid upturn |
| **Other relevant entity-specific events** | Significant Brexit exposure / Supply chain issues |
| **Events affecting a CGU/RU** | Exposure to Ukraine/Russia conflict |
| **A sustained decrease in share price** | Directly observable for public companies, but may be an indirect indication for private companies if the sector as a whole is down |

# ESMA Priorities for 2022 IFRS Annual Financials Related to IAS 36

As of October 2022

## 2022 Priorities

- **Climate-related risks:** examples of potential impairment indicators include decreased demand for goods and services, changes in plans for the CGU/assets, increased costs related to energy transition.
- **Direct financial impacts of Russia-Ukraine war:** issuers should consider the impact of various energy price-scenarios and potential restrictions in their impairment test sensitivity analysis.
- **Macroeconomic environment:** issuers should consider challenges resulting from a combination of remaining pandemic-related effects, inflation, increase in the interest rates, deterioration of the business climate, geopolitical risks. Discount rates / WACCs were particularly highlighted as a potential cause of impairment.

## Example of 2021 enforcement cycle (May 2022)

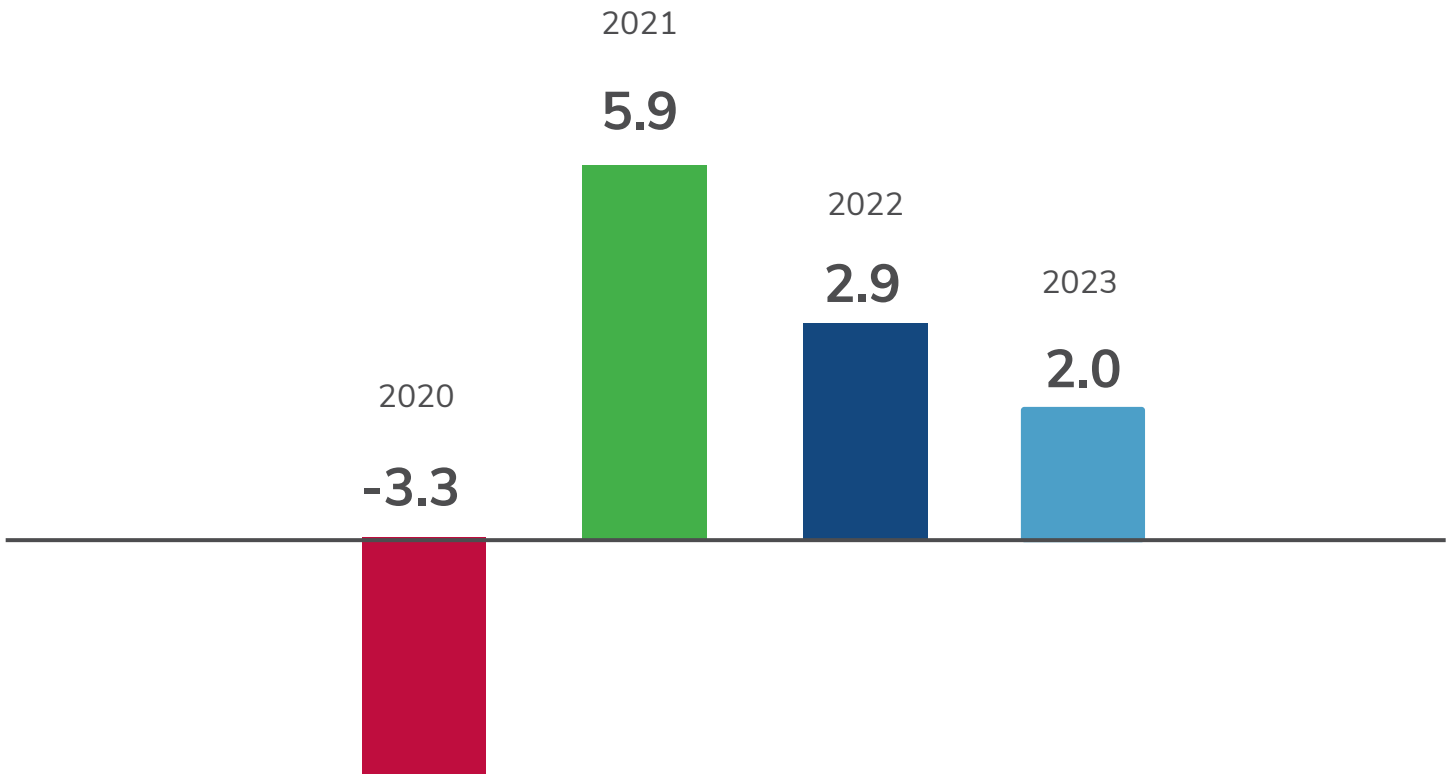
- Issuer was a maritime transport group focused on carrying passengers and cars
- ESMA disagreed with issuer when the latter concluded that COVID-19 impairment indicators were not present. Issuer claimed that lockdowns were a one-off situation with no impact on long-term value of vessels.

Sources:
https://www.esma.europa.eu/sites/default/files/library/esma32-63-1320_esma_statement_on_european_common_enforcement_priorities_for_2022_annual_reports.pdf
https://www.esma.europa.eu/sites/default/files/library/esma32-63-1224_26th_extract_of_eecs_decisions.pdf

# 4. Global Economic Outlook

# Real GDP Growth (%) Estimates by Region: World

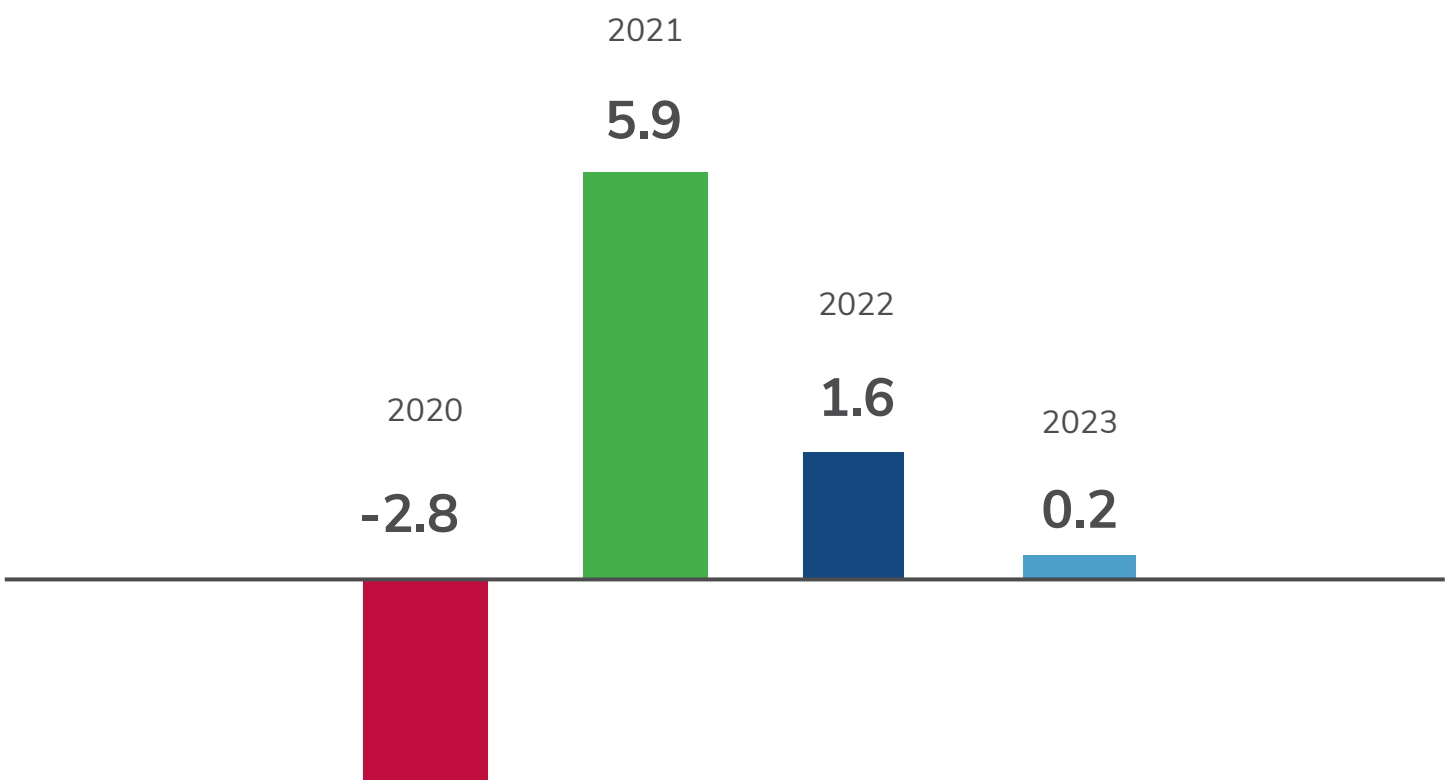
Data as of October 15, 2022




Sources: OECD, International Monetary Fund, World Bank, Blue Chip Economic Indicators, Consensus Economics, Economic Intelligence Unit, Fitch Ratings, IHS Markit, Moody's Analytics, Oxford Economics and S&P Global Ratingsh

# Real GDP Growth (%) Estimates by Region: United States

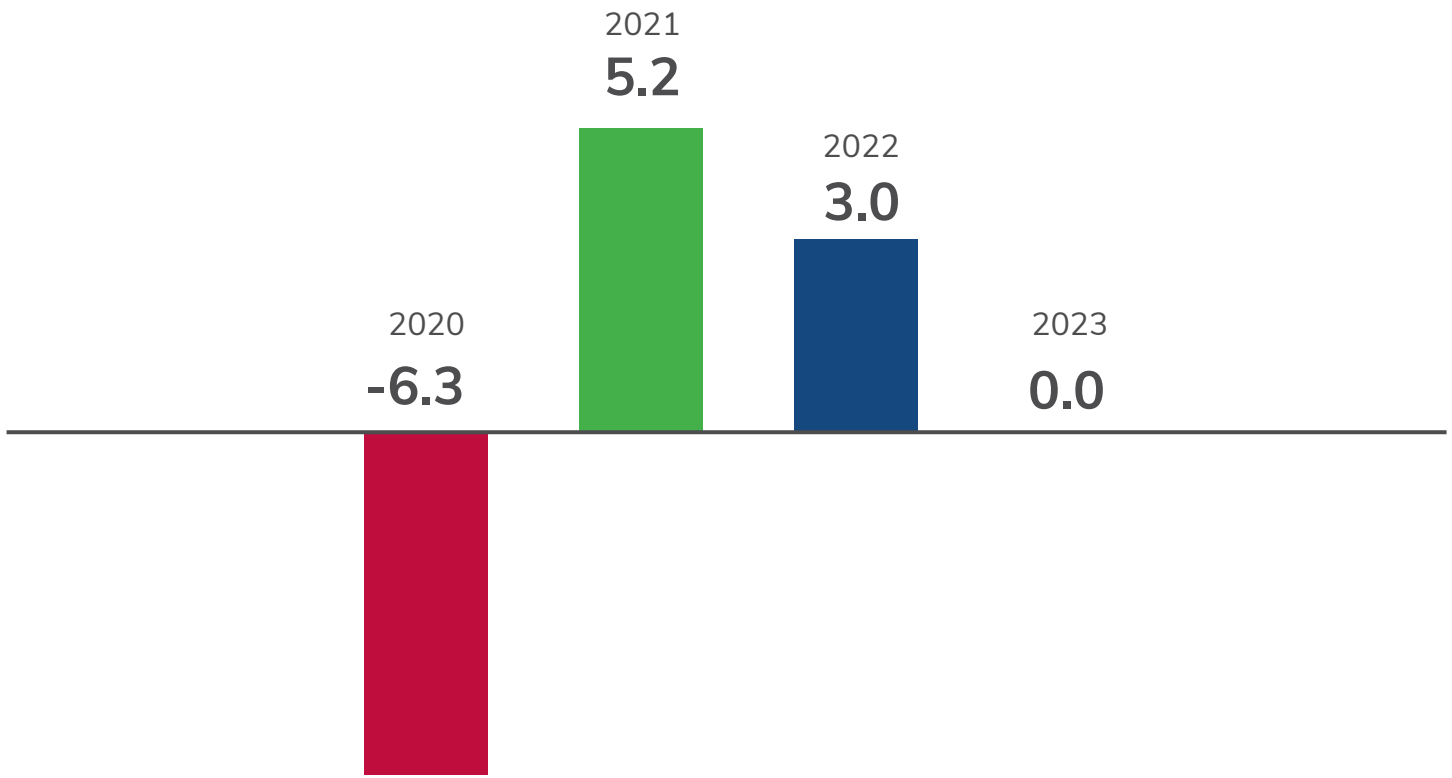
Data as of October 15, 2022




Sources: OECD, International Monetary Fund, World Bank, Blue Chip Economic Indicators, Consensus Economics, Economic Intelligence Unit, Fitch Ratings, IHS Markit, Moody's Analytics, Oxford Economics and S&P Global Ratingsh

# Real GDP Growth (%) Estimates by Region: Eurozone

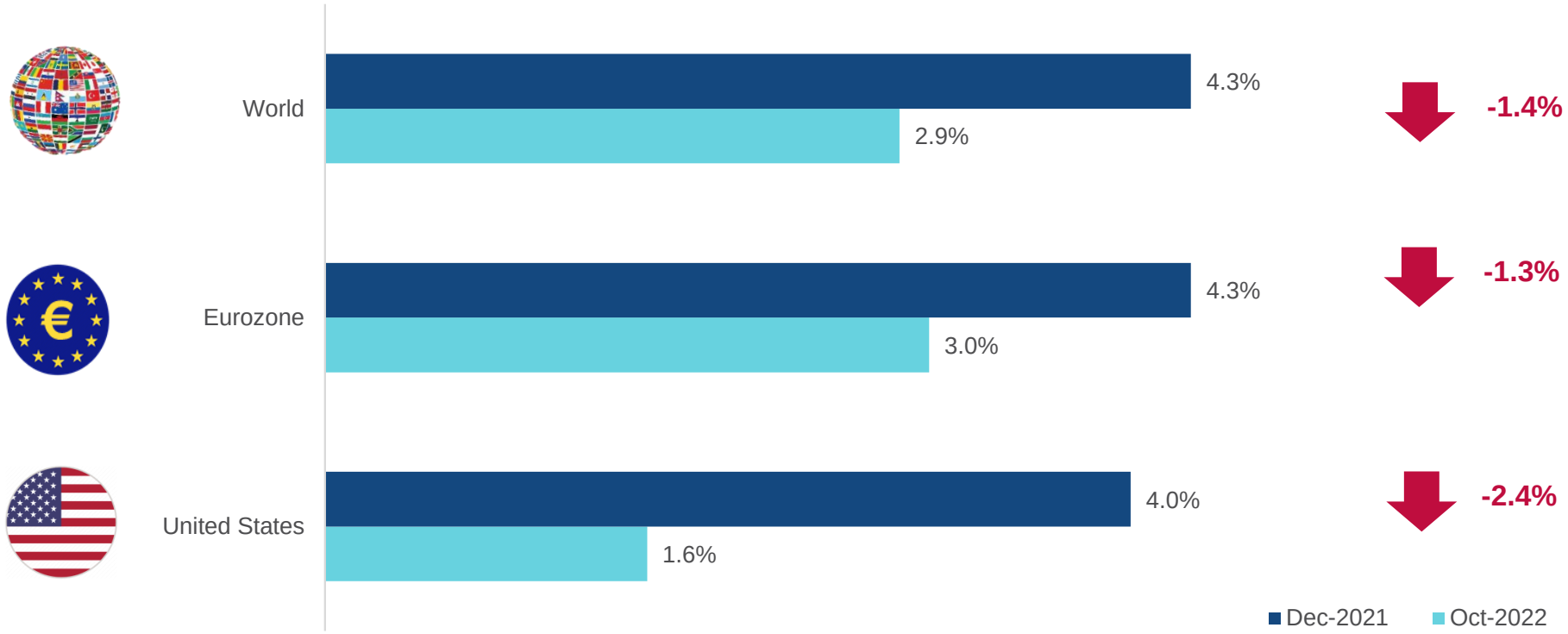
Data as of October 15, 2022




Sources: OECD, International Monetary Fund, World Bank, Blue Chip Economic Indicators, Consensus Economics, Economic Intelligence Unit, Fitch Ratings, IHS Markit, Moody's Analytics, Oxford Economics and S&P Global Ratingsh

# 2022 Real GDP Growth Rates of World, U.S., Eurozone

Data as of October 15, 2022




Sources: OECD, International Monetary Fund, World Bank, Blue Chip Economic Indicators, Consensus Economics, Economic Intelligence Unit, Fitch Ratings, IHS Markit, Moody's Analytics, Oxford Economics and S&P Global Ratingsh

# 5. Expected Cash Flows and Scenarios

# GWI Testing Process Selection

## Process selection depends on basis of Prospective Financial Information (PFI)

Is the PFI prepared by the company reflective of:

- Strategic Plan PFI → company-specific perspective

  **OR**

- Market Participant (MP) based PFI → fair value perspective

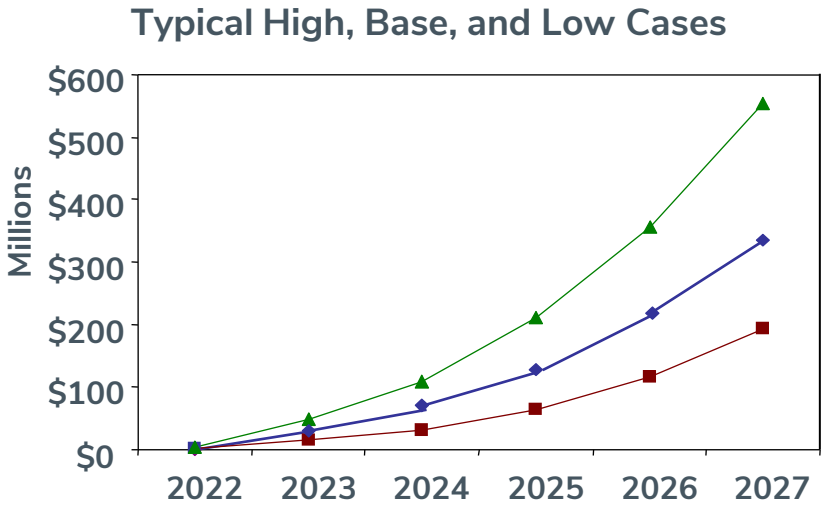
## Overall objective of process

1. To estimate fair values of the RUs/CGUs for the purpose of the GWI test
2. To explain any differences between the sum of the fair values of the RUs/CGUs and market capitalization/MVIC
3. To support any implied control premium or market participant acquisition premium (MPAP) between (1) and (2)

# Developing PFI: What Can Go Wrong?

**The majority of investments fail to return the value anticipated. Why?**

- Hidden or unclear assumptions
- Invalid assumptions or biased outlook
- Focus on non-material assumptions
- Hard to grasp value when there's more than one uncertainty




- A single nominal base case, or even perfunctory high and low scenarios, can obscure the true value if risks are asymmetric
- Inappropriate discount rates can make a good investment look bad, or a bad investment look good
- Post-deal scramble when the base case is not achieved / don't have the right post-deal adjustments in place

# Hidden Assumptions

**First step in improving projections is to identify all the underlying assumptions – including what is taken for granted**

**It's the hidden assumptions that cause problems:**

- Scope
- Competitive landscape
- Schedule
- Procurement/stability/effectiveness of partner & supplier relationships
- Stock Options
- Operating efficiencies
- Taxes
- Trends
- Inflation

**A rigorous process is needed to scrutinize the projections and identify the unstated assumptions.**

**E.g., *Pretend you have a crystal ball and can look 3 years into the future…***

- Suppose I told you that profits were twice what you thought they would be. How did this happen?
- Suppose I told you that profits were half what you thought they would be. How did this happen?

# Single Scenario vs. Scenario-based Method Representative of Expected Value

Value indication: single scenario based on a neutral and unbiased set of Prospective Financial Information (PFI)

The PFI itself is not weighted rather an expected revenue forecast is derived and the expenses and investments are correlated to revenue.

OR

| | | | |
|---|---|---|---|
| Scenario A Value Indication | X | Probability of Scenario A | |
| Scenario B Value Indication | X | Probability of Scenario B | |
| Scenario C Value Indication | X | Probability of Scenario C | |
| Scenario D Value Indication | X | Probability of Scenario D | |

Expected Value

Measuring the economic impacts in the post-COVID-19 market environment is challenging and best performed by developing discrete scenarios of potential outcomes

# Risk-Adjusting Cash Flows

**Traditional valuations often fail to fully account for risk**

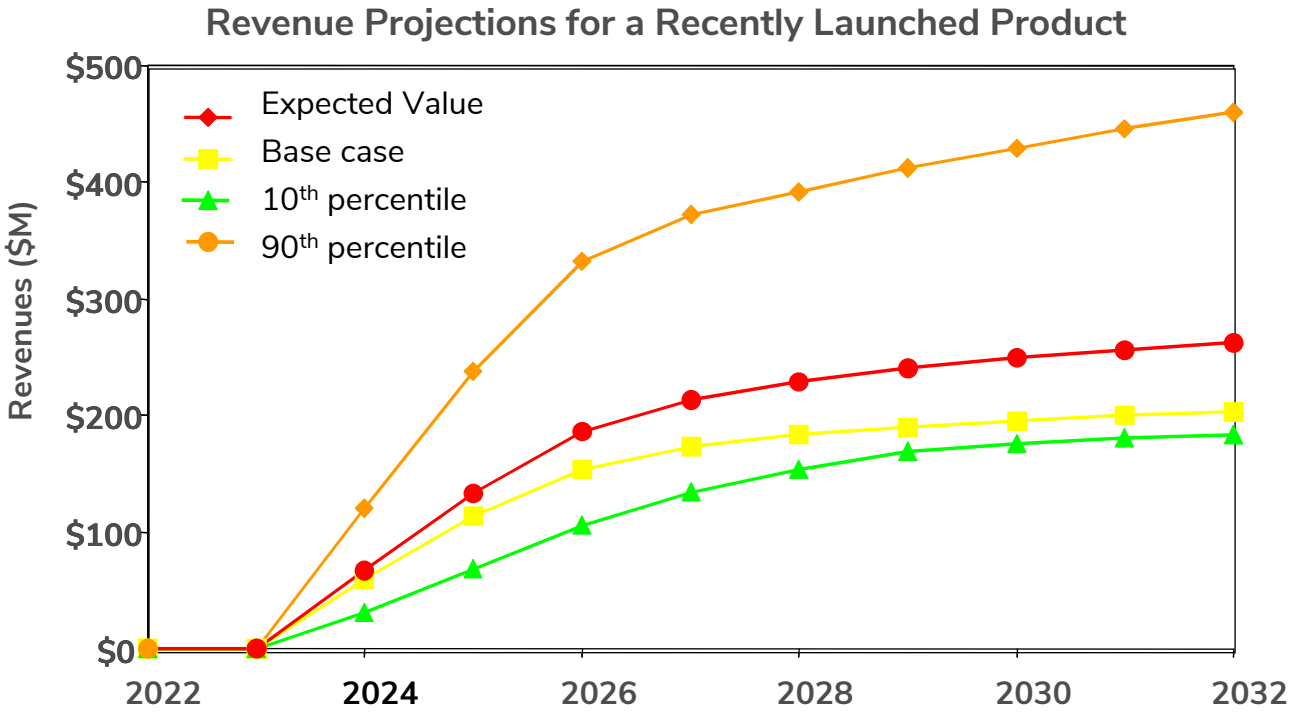
**Key is to quantify risk, and adjust cash flows appropriately**

1. Improved methods identify, quantify, and communicate uncertainty about important financial parameters, such as:
   - Size of market (e.g., growth of current and new markets, penetration rates)
   - Revenue growth (e.g., pricing, degree of competition)
   - Cost and expense assumptions (e.g., sales & marketing costs, G&A, production costs, commodity price volatility)
   - Timing assumptions (e.g., time until new product launch, to open a new plant)
2. Improved methods address management options that maximize value by taking advantage of up-sides or mitigating down-sides, such as:
   - Execute now or “wait-and-see”
   - Pursue a phased rollout
   - Expand into new geographies / pull out of certain markets

# Capturing Risks: Multiple Scenarios

When Does It Matter?

- **If upside/downside outcomes are not symmetric, you must look at expected value, not at nominal projections and alternative scenarios**




Explicitly modeling the upside/downside potential gives a more accurate picture of value:

- In this example, there is greater upside potential than downside risk.

# Real Options Analysis

**Traditional discounted cash flow models may underestimate the value of investments, if any of the following types of strategic options are embedded in the investments:**

- **Delay**: Delay or defer making an investment
- **Flexibility**: Adjust or alter production schedules as price changes
- **Expansion**: Expand into (or pull out of) markets or products at later stages in the process, based upon observing favorable outcomes at the early stages
- **Abandonment**: Stop production or abandon investments if the outcomes are unfavorable at early stages

**Questions to consider:**

- When do valuable options exist?
- How do you quantify the value of real options?
- When should the values of such options be included in PFI for GWI purposes?

# Capturing Risks: Real Options

When Does It Matter?

**Lots of uncertainty about the future, e.g.**

- Transaction involving technology or market that is new / less familiar to buyer
- The industry is evolving: history is not a good guide for the future
- Success of not-yet-launched products or aggressive expansion plan
- Ability to achieve synergies
- Competitive or regulatory uncertainties
- Litigation risk

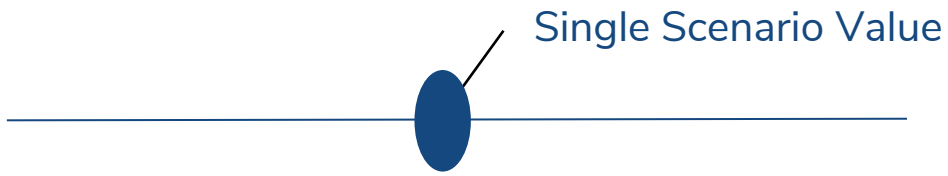
**Complexity**

- Complex deal structure (non-linear structures)
- Contingent terms (e.g., contingent consideration)

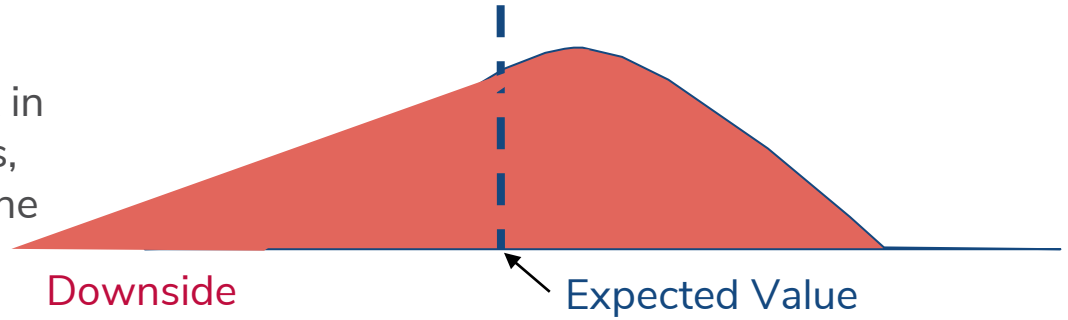
# Real Options: Capturing Flexibility

**Real Option Valuation captures management flexibilities to further expand on the upside and mitigate the downside.**

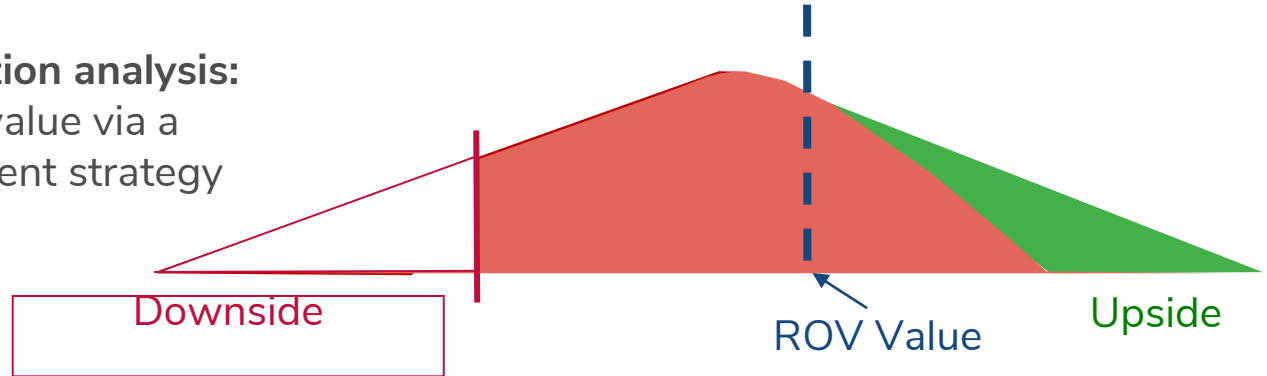
**Typical discounted cash flow valuation:** Single Base Case




**Probabilistic analysis:** incorporate risk in the cash flows, rather than in the discount rate




**Real option analysis:** add value via a contingent strategy

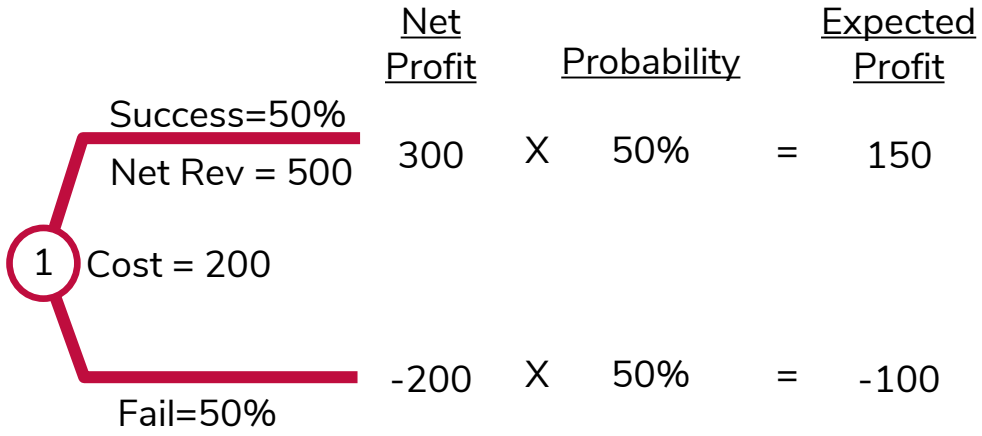


# Best Practices in Developing Cash Flow Projections

Real Options: Example #1

## A simple numerical example illustrating Real Option Valuation

- Suppose we have a venture with overall chance of success of 50%
- A traditional, one-stage approach calculates the net revenues given success, estimates the total cost, and uses a probability-weighted average to understand value of the venture



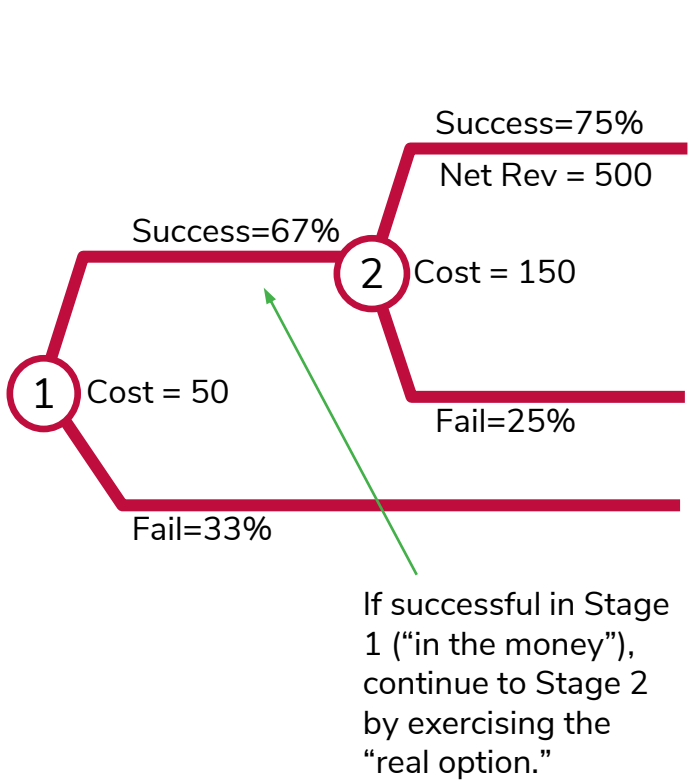

**150 – 100 = 50 = Value of Venture**

**A typical approach is to build the "success case" and then discount it heavily based on the riskiness of the venture. How close to the true value will that get us?**

# Best Practices in Developing Cash Flow Projections

Real Options: Example #2

## Adopting a multi-stage approach increases value




| | Net Profit | | Probability | | Expected Profit |
|---|---|---|---|---|---|
| Success=75% | 300 | X | 50% | = | 150 |
| Fail=25% | -200 | X | 17% | = | -34 |
| Fail=33% | -50 | X | 33% | = | -16.5 |

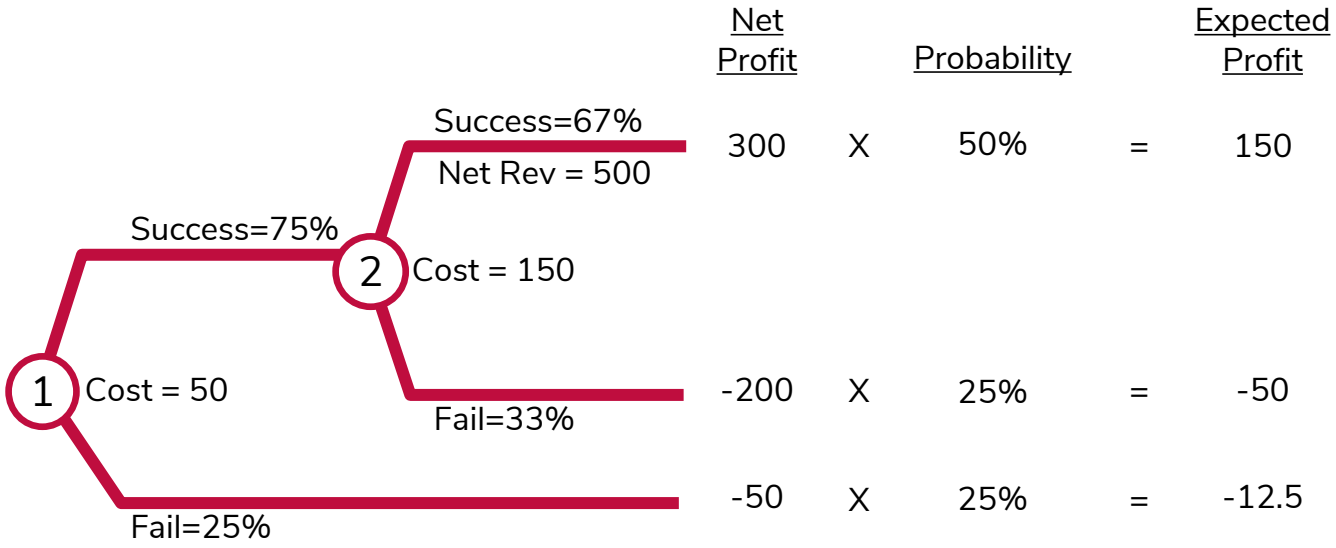
**150 – 34 – 16.5 = 99.5 = Value of Venture**

**P(success) is still ½. Cost is still 200. Net profit given success is still 300.**
**Adding a real option to kill the project based on initial results doubles the value.**

# Best Practices in Developing Cash Flow Projections

Real Options: Example #3

**Ventures with higher probability of failing later are worth less than ventures with higher probability of failing early**



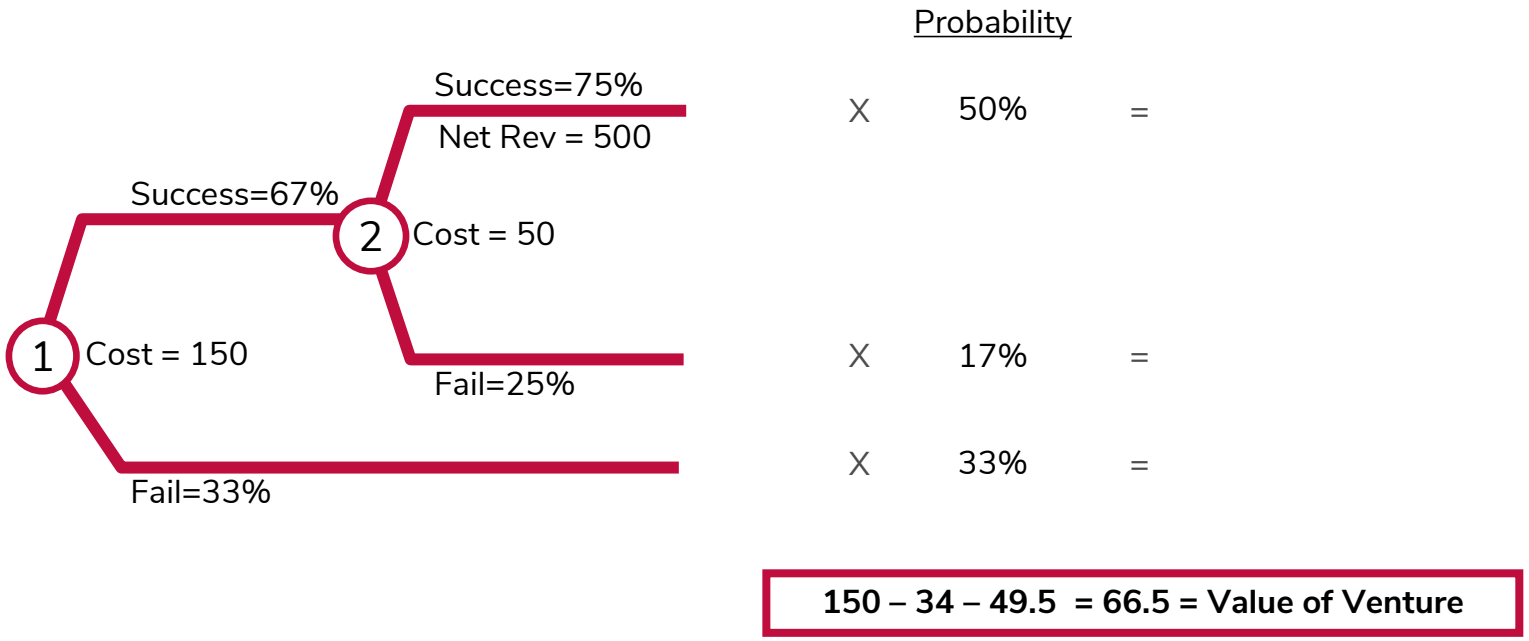

**150 – 50 – 12.5 = 87.5 = Value of Venture**

**Same as preceding case, but the 3/4 and 2/3 chances of success are swapped. Value is down from 100 to 88.**

# Best Practices in Developing Cash Flow Projections

Real Options: Example #4

**Ventures with costs occurring earlier are worth less than ventures with costs occurring later**




**150 – 34 – 49.5 = 66.5 = Value of Venture**

**Same as 1st multi-stage slide, but the 50 and 150 costs are swapped.**
**Value is down from 100 to 67.**

# Real Options – Relationship to Business Management

Real Option Valuation comprehends that a business's value is inseparable from business management

*The value of a RU/CGU is driven by how it is managed.*
*The best value can only be achieved by managing optionality appropriately.*


*Management choices depend on the value of alternative courses of action.*
*The best can be achieved only by valuing alternatives appropriately.*

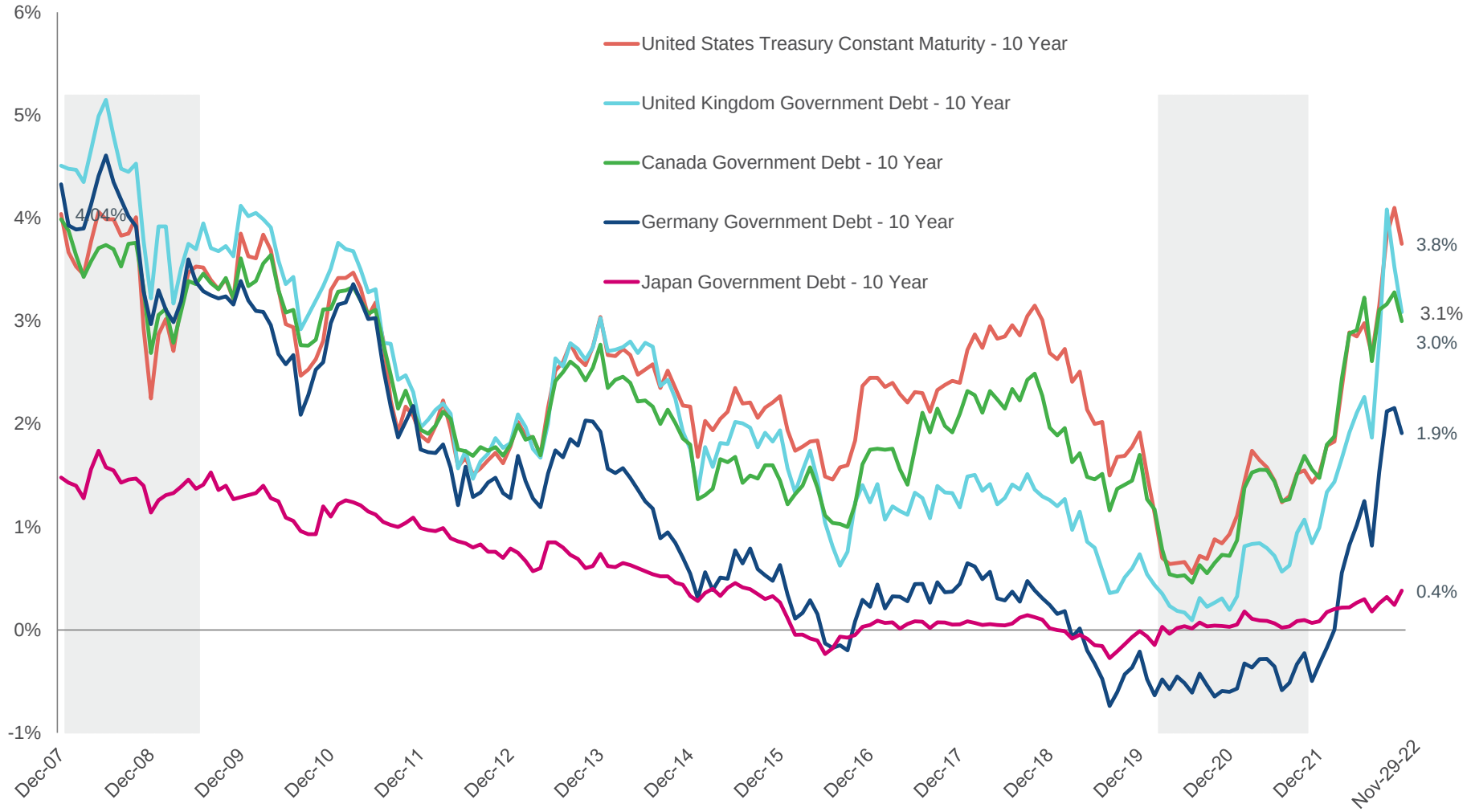
**Real Option Value should only be included in GWI PFI projections to the extent that a Market Participant could take advantage of the same options.**

# 6. Discount Rate Considerations

KROLL

# 10-Year Yields for U.S., Canada, U.K., Germany, Japan,

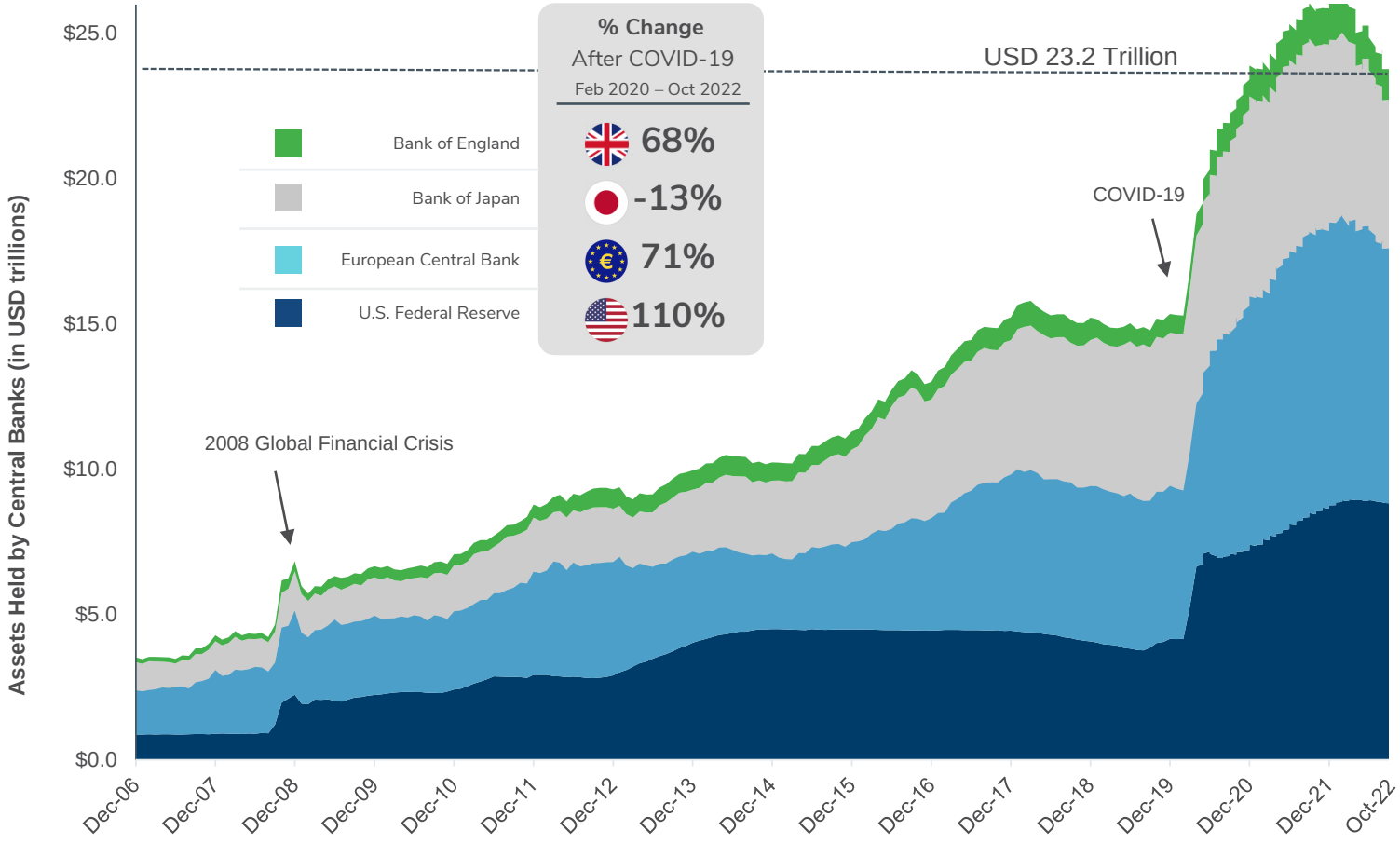
December 31, 2007 – November 29, 2022




Source: S&P Capital IQ

# Combined Major Central Banks Balance Sheets: Fed, ECB, BOJ, BOE

December 31, 2006 – October 31, 2022




Source: Federal Reserve Bank of St. Louis FRED® Economic Data, Bank of England, Bank of Japan and European Central Bank

# 12-Month Percentage Change (%) in Consumer Price Inflation (CPI) Index (YOY)

| | October 2022 | Comments |
|---|---|---|
| United States | 7.7% | Down from 8.2% in August, a fourth consecutive monthly drop. The lowest regain since January, but still near 40-year highs. |
| Canada | 6.9% | Matching the 6.9% increase in September 2022, largely driven by energy and food prices. Still near 31-year record high. |
| United Kingdom | 11.1% | New 40-year record high. Up from 10.1% in September 2022, largely driven by higher electricity prices, but food prices also contributing significantly. |
| Germany* | 10.4% | New all-time high since recorded history starting in 1951. Largely driven by price rises for energy products, but to some extent food. Preliminary November report indicates a slight decrease to 10.0%. |
| Eurozone | 10.6% | Record since series creation in January 1997 (25 years ago), just prior to the launch of the euro, driven primarily by unprocessed food and energy prices. Preliminary November report indicates a slight decrease to 10.0%. |

Source: U.S. Bureau of Labor Statistics, Statistics Canada, U.K. Office for National Statistics, Germany's Destatis Statistisches Bundesamt, Eurostat.
* Non-harmonized measure.

# Fed Funds Target Range (Dec 2008 – Sep 2022)

Through November 29, 2022


Date the Federal Open Market Committee (FOMC) Changed the Fed Funds Target Rate

# The Risk-free Rate ($R_f$) – Spot Rate or "Normalized" Rate?

During periods in which risk-free rates appear to be **abnormally low** due to flights to quality or massive monetary policy interventions (i.e., QE or quantitative easing)

**Kroll recommends normalizing the risk-free rate:**

**Abnormally Low $R_f$**

**Use Normalized Risk-free Rate**

# The Risk-free Rate ($R_f$) – Spot Rate or Normalized Rate or "Normalized" Rate?

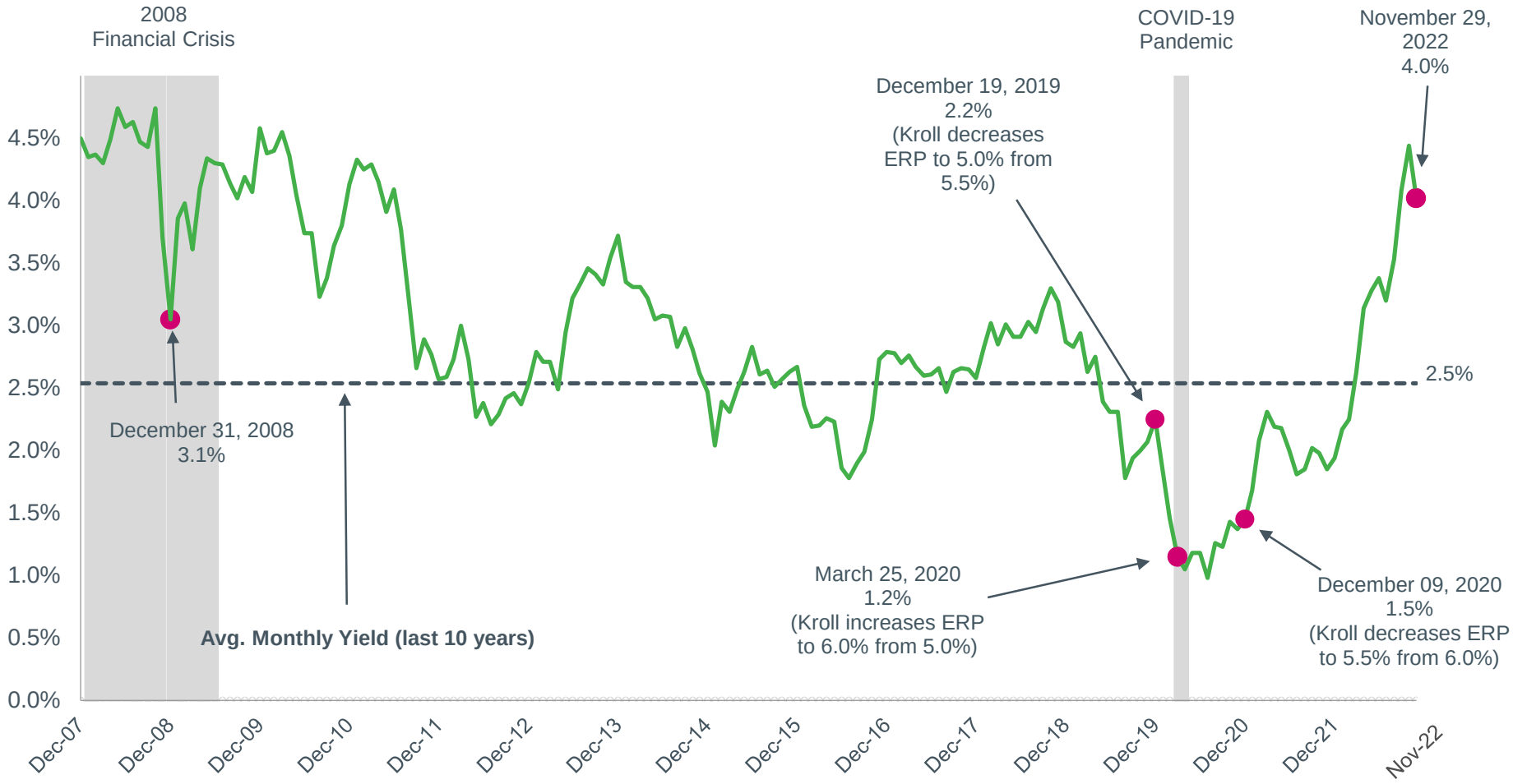
**Normalization can be accomplished in several ways, including:**

1. **Simple averaging**

2. **Various "buildup" methods**

# U.S. 20-Year Treasury Yield, Including Trailing Average

December 31, 2007 – November 29, 2022




**What is it as of 30 Nov 2022?**

**4.0%**

Source: 20-year U.S. government bond series. Board of Governors of the Federal Reserve System

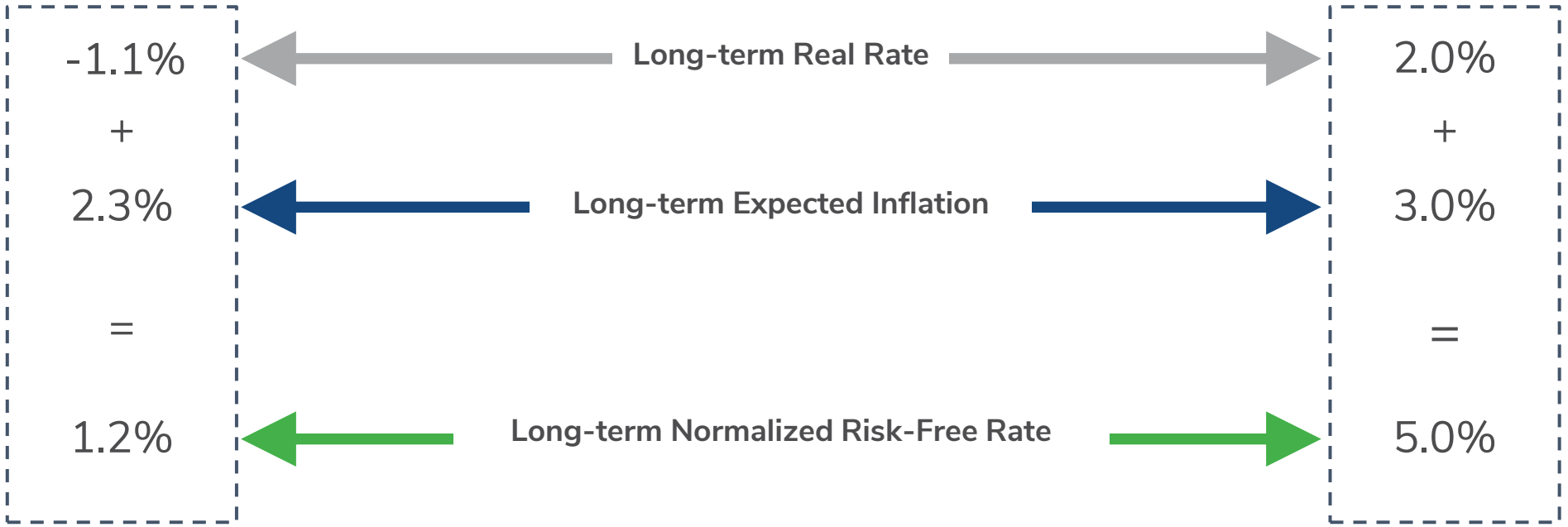
# Risk-free Rate Normalization – by Build Up "Fisher Equation"

Conceptually, the risk-free rate can be (loosely) illustrated as the return on the following two components:*


* This is a simplified version of the "Fisher equation", named after Irving Fisher. Fisher's "The Theory of Interest" was first published by Macmillan (New York), in 1930. The Fisher equation is formally expressed as (1 + Nominal Rate) = (1 + Real Rate) x (1 + Expected Inflation). When rates are low, there is very little difference between the simple form and the Fisher equation. Various academic research papers show that the decomposition of the nominal rate into a real rate and expected inflation should include an additional component excluded from the Fisher equation: the inflation risk premium. This premium reflects the risk that actual inflation may vary significantly from expected inflation, and it can be positive or negative, with some academic estimates at close to 0%.

# Risk-Free Rate Normalization – United States

As of October 31, 2022 (approximately)




What is the spot 20-year yield as of 30 Nov 2022?

4.0%

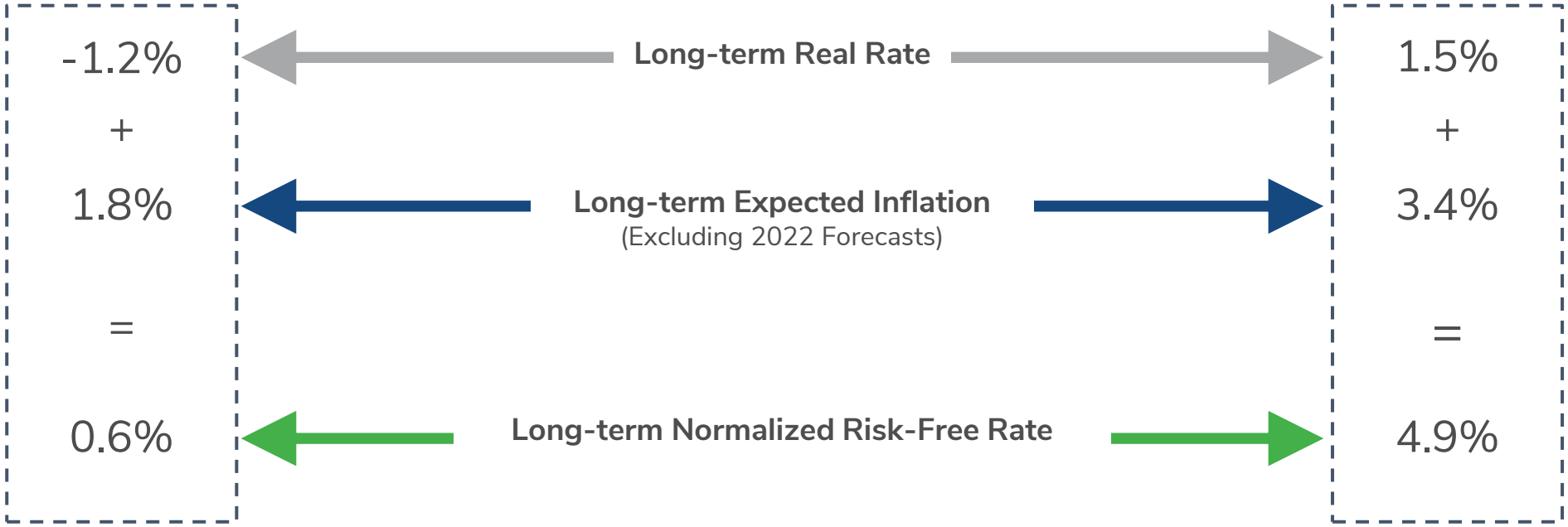
- **Fisher Equation:** Midpoint = 3.1% / Median = 3.5%
- **LT Average:** 10-Year Trailing Average of 20-Year U.S. Treasury Yield = 2.5%

**Concluded Normalized $R_f$ = 3.5%**

**Guidance:** Use the higher of the Spot Rate or the Normalized Risk-free Rate.

# Risk-Free Rate Normalization – Germany

As of October 31, 2022 (approximately)




**What is the spot 15-year yield as of 30 Nov 2022?**

**1.9%**

- **Fisher Equation:** Midpoint = 2.8% / Median = 3.6%
- **LT Average:** 10-Year Trailing Average of *15-Year Bund Yield* = 0.8%

**Concluded Normalized $R_f$ = 3.0%**

**Guidance:** Use the higher of the Spot Rate or the Normalized Risk-free Rate.

# The Kroll Recommended ERP is a Two-Step Process

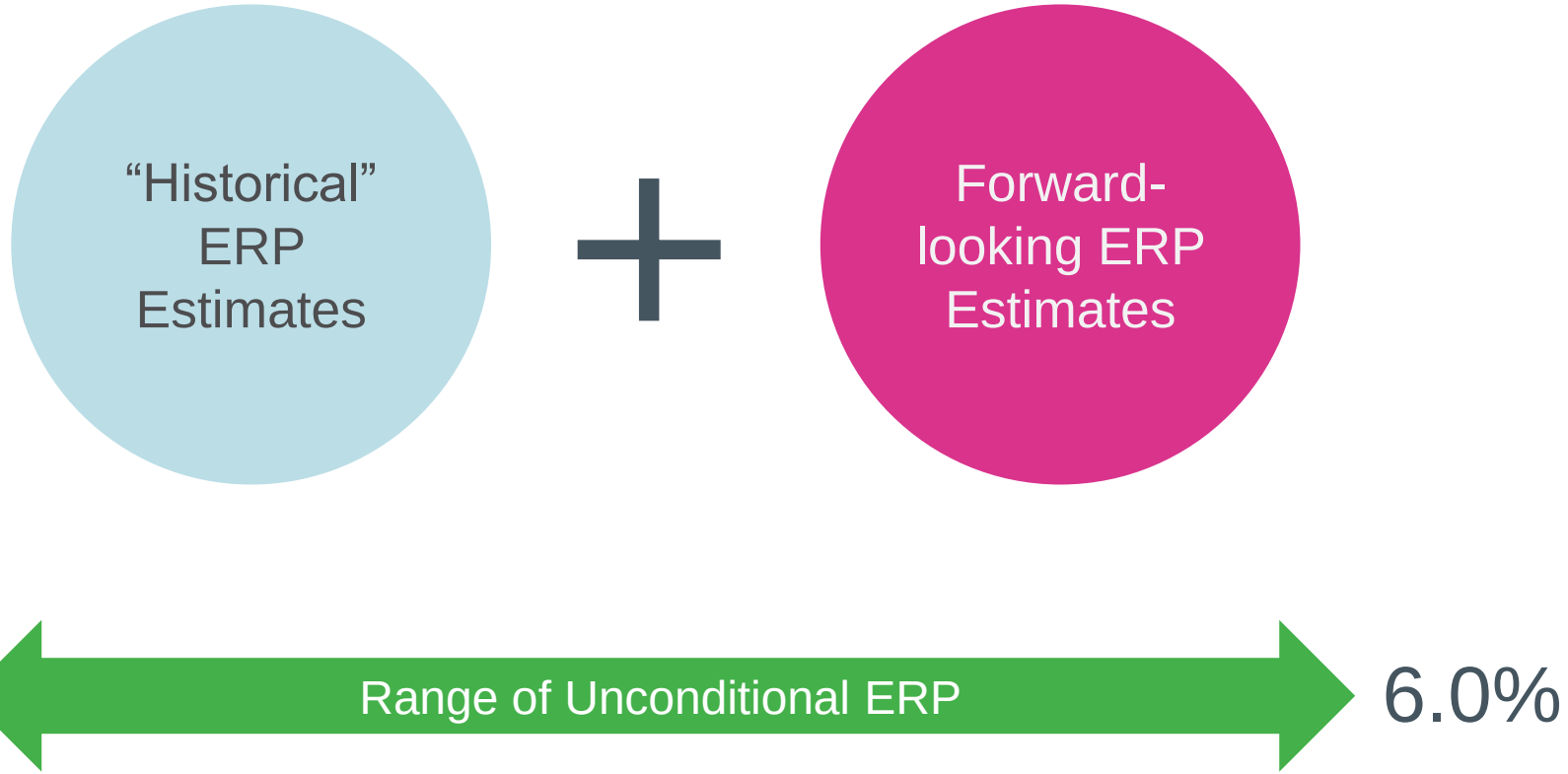
**STEP 1:** What is a reasonable range of unconditional ERP that can be expected over an entire business cycle?

*"What is the range?"*

**STEP 2:** Research has shown that ERP is cyclical during the business cycle. We use the term conditional ERP to mean the ERP that reflects current market conditions.

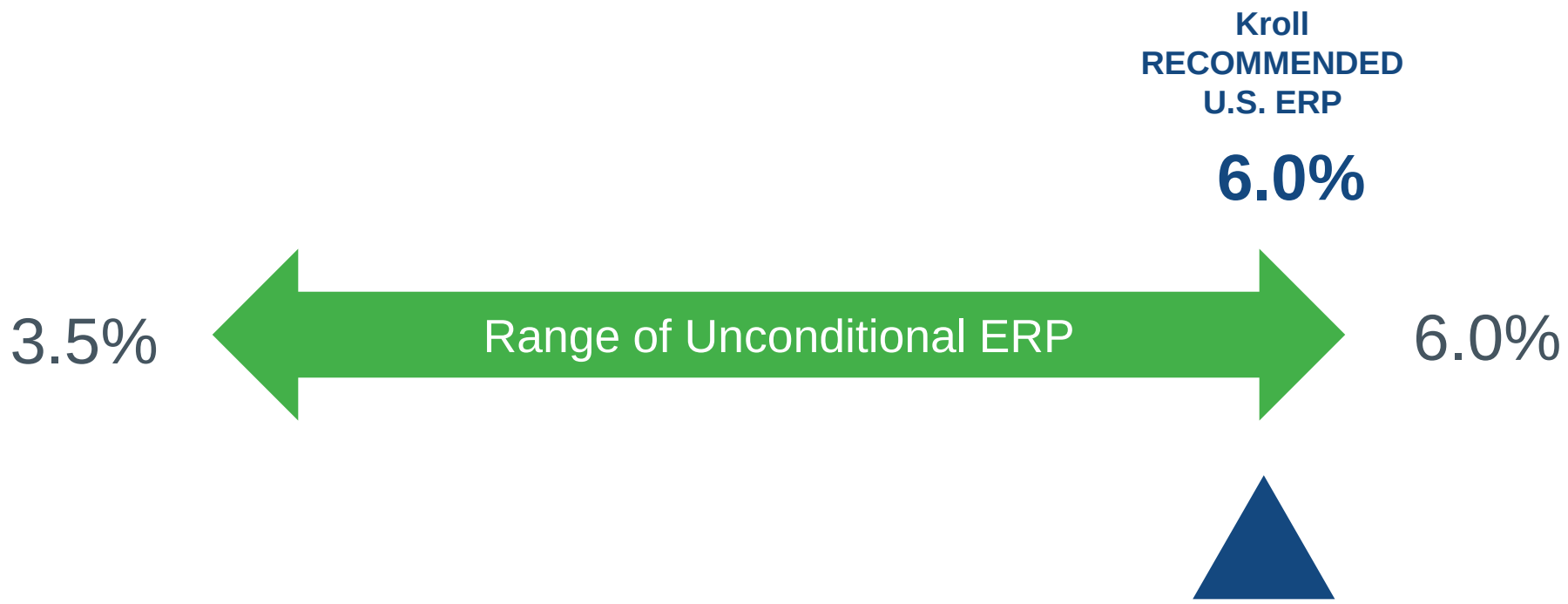
*"Where are we in the range?"*

# Kroll Considers Multiple Models to Estimate U.S. ERP



# Kroll Considers Multiple Models to Estimate U.S. ERP

Effective of October 18, 2022 and thereafter, until further guidance is issued



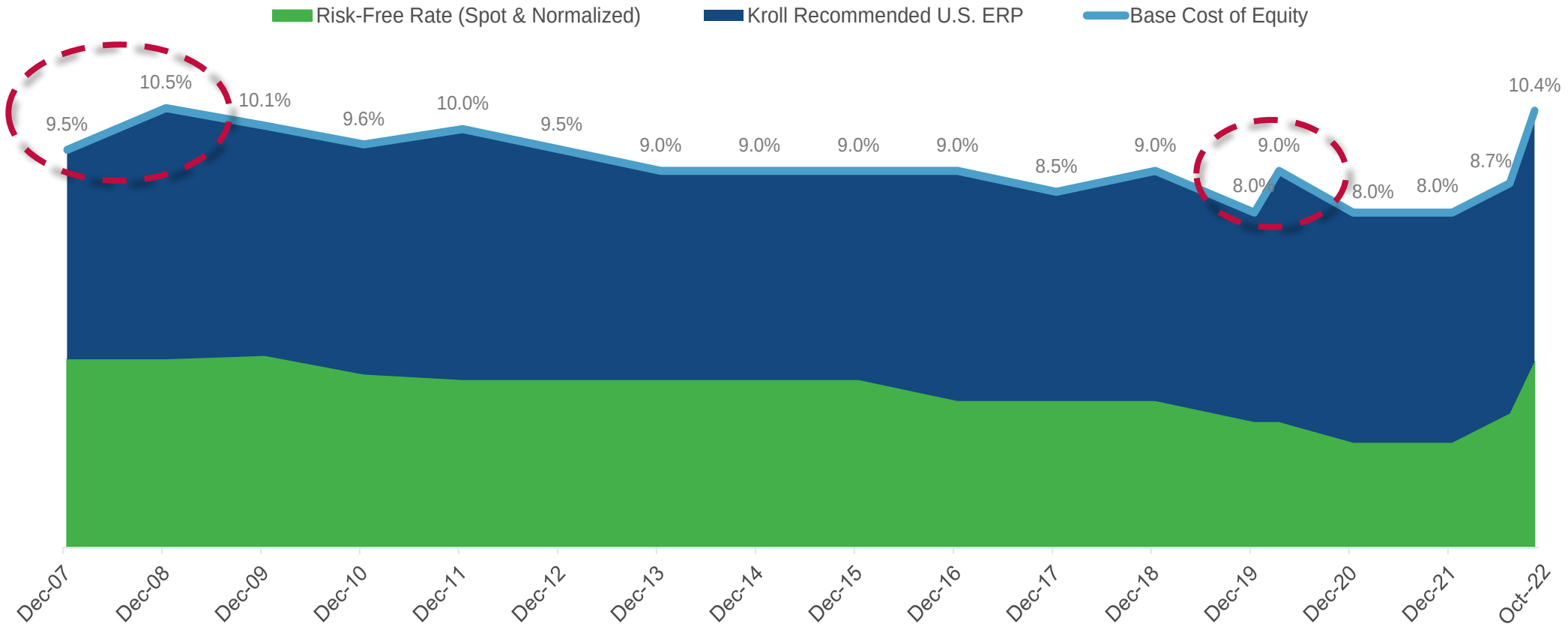
# Factors Considered in ERP Recommendation – Summary Table

Changes from December 9, 2020 to October 1, 2022

| | Factor | Change | Effect on ERP |
|---|---|---|---|
| Financial Markets | U.S. Equity Markets | ▼ | ▲ |
| | Implied Equity Market Volatility | ▲ | ▲ |
| | Corporate Credit Spreads | ▲ | ▲ |
| | Damodaran Implied ERP Model | ▲ | ▲ |
| | Default Spread Model | ▲ | ▲ |
| | U.S. Equity Market Uncertainty Index | ▼ | ▼ |
| Economic Indicators | Historical & Projected Real GDP Growth | ◀▶ | ◀▶ |
| | Unemployment | ▼ | ▼ |
| | Consumer Sentiment | ▼ | ▲ |
| | Business Confidence | ▼ | ▲ |
| | Sovereign Credit Ratings | ◀▶ | ◀▶ |

# Current U.S. Normalized Risk-free Rate* and ERP Recommendations

As of October 31, 2022




*Current guidance recommends using a spot-risk free rate when it exceeds the Normalized Risk-free Rate of 3.5%. Where applicable, the spot rate is used in the exhibit above.

# Summary Table of Factors – Eurozone

Changes from December 31, 2021 to October 1, 2022

| | Factor | Change | Effect on ERP |
|---|---|---|---|
| Financial Markets | European Equity Markets | ▼ | ▲ |
| | Implied Equity Market Volatility | ▲ | ▲ |
| | Corporate Credit Spreads | ▲ | ▲ |
| | Dividend Discount Model Implied ERP | ▲ | ▲ |
| | Default Spread Model | ▲ | ▲ |
| Economic Indicators | Historical & Projected Real GDP Growth | ▼ | ▲ |
| | Unemployment | ▼ | ▼ |
| | Consumer Sentiment | ▼ | ▲ |
| | Business Confidence | ▼ | ▲ |
| | Sovereign Credit Ratings | ◄► | ◄► |
| | Economic Policy Uncertainty (EPU) Index | ▲ | ▲ |

# Kroll Recommended Eurozone Equity Risk Premium

German Investor Perspective applied to EUR-Denominated Projections *

| | December 31, 2019 | March 31, 2020 | December 31, 2021 | October 31, 2022 |
|---|---|---|---|---|
| Normalized Risk-Free Rate – Germany | 2.0% | 2.0% | 1.5% | 3.0% |
| Eurozone Equity Risk Premium Recommendation | 4.5% to 5.0% | 5.5% to 6.0% | 5.5% to 6.0% | 5.5% to 6.0% |
| **Base Cost of Equity** | 6.5% to 7.0% | 7.5% to 8.0% | 7.0% to 7.5% | 8.5% to 9.0% |

* Some countries may have regulations or guidelines that preclude the use of normalized risk-free rates. The Kroll approach does not supersede such local guidance. In Germany, for instance, the IDW (Institute of German Chartered Accountants) created a committee (FAUB) whose function is to issue guidance regarding (company) valuation topics. Under FAUB guidance, when estimating cost of capital using CAPM, a spot risk-free rate (Svensson method) should be used, while the ERP will change over time to reflect changes in the risk aversion.

# Inferred ERP: Using the Kroll Eurozone Recommended ERP Against A Spot German Risk-free Rate

As of November 30, 2022

| | Kroll Eurozone Recommended ERP | | German Normalized Risk-free Rate | | 15-Year German Government Spot Yield * | | Inferred Eurozone ERP |
|---|---|---|---|---|---|---|---|
| Low Range | 5.5% | + | 3.0% | − | 1.9% | = | 6.6% |
| High Range | 6.0% | + | 3.0% | − | 1.9% | = | 7.1% |

* Source: Deutsche Bundesbank

# Other Cost of Capital Inputs

Selected Considerations

| Cost of Capital Input | Considerations in the Current Environment |
|---|---|
| **Betas** | • Levered betas in some industries are distorted post-coronavirus. Consider using longer look-back period (e.g., 5-year monthly betas)<br>• Significant equity market declines can lead to greater debt % in the capital structure, which may significantly distort the calculated unlevered betas. Hamada unlevering formula may exacerbate the issue.<br>• Consider using other unlevering methods (e.g. Harris-Pringle) in the current environment |
| **Pre-Tax Cost of Debt** | • Don't automatically assume BBB rating for industry peers.<br>• Subsidized loans, or below-market interest rates on existing debt should not be used in WACC calculation. |
| **Capital Structure** | • Corporate finance theory tells us to use market value weights for debt component<br>• Don't automatically assume debt book value = market value, when interest rates are rising<br>• Review fair value footnotes in annual & interim financials<br>• Consider longer-term averages instead of point-in-time capital structure |

# 7. Market Approach & Market Cap Reconciliation

KROLL

# Considerations in Applying the Market Approach

- **The Market Approach can also be applied when considering Fair Value**

- **MVIC (Market Value of Invested Capital) should be derived with appropriate consideration of recent price trends**
  - Equity prices considering recent trends with appropriate sensitivities.
  - Book value of debt may not be representative of fair value.
  - Total invested capital (TIC) should therefore consider sensitivities, including a range from book value to fair value of debt as debt has first claim on the capital and it is possible that debtholders can get par value back.

- **Considering forward and trailing multiples**
  - Trailing multiples (e.g. MVIC/LTM EBITDA) and earnings parameters (e.g. LTM EBITDA) may not be appropriate in an environment where they are not representative future performance.
  - Need to ensure consistency between the comparable companies and the relevant CGU / RU
  - Forward-looking earnings parameters should be derived from analyst expectations reflecting the current market environment
  - Market multiples are applied to forward looking earnings parameters that are consistent with the expected PFI for the company.

# Considerations in Applying the Market Approach

- In theory, the market approach (using listed comparable companies) yields a **minority marketable value**. Further consideration should be given to control premiums/MPAP when looking at a RU/CGU.

- To the extent there are comparable market transactions, the market transaction method should be applied with caution. One should understand the economics embedded in the deal price and whether it is reflective of current market conditions. In theory, this approach yields a **controlling marketable value**.

# 8. Key Takeaways

KROLL

# Takeaways of Today's Presentation

**Record high inflation is profoundly changing key value drivers:**

- Projected Growth Rates and operating margins
- Discount Rates

**Need to adjust cash flow projections for information known as of the valuation date:**

- Use multiple sources of data, particularly when there is a heighted level of uncertainty
- Scenario analyses will likely be a better way to capture some of that uncertainty.
- Discount rates cannot solve all the issues

**Interest rates of safe-haven countries are still relatively low from an historical perspective, but are rising rapidly and significantly** due to Central Banks actions in their attempt to tame inflationary pressures. **Cost of debt** is increasing accordingly.

**Stock price and market volatility will impact the application of the market approach and market cap reconciliation**

# PFI for GWI Testing - Key Takeaways

- Traditional approaches may not be well-suited for at-risk businesses or intangibles
- Considering multiple scenarios can help capture the inherent risk related to future outcomes
- Best practices for improving PFI for GWI purposes include:
  - Clearly stating **all** the key assumptions, eliminate "hidden" assumptions
  - Quantify and communicate the impact of *each* key uncertainty
  - Capture each of the material drivers of overall value (e.g., synergies) from a market participant perspective
- Capturing the options nature of asset return improves upon traditional valuations