CIEBA

Committee on Investment of Employee Benefit Assets Inc.

Virtual Working Group Meeting

January 12-13, 2021

CIEBA January Virtual Working Group Meeting
January 12-13, 2021
via zoom.us (meeting link to be provided)

AGENDA

<u>Tuesday, January 12, 2021 (all times are EST)</u>

11:00 am – 11:05 am	*Introductory Remarks*
11:05 am – 11:50 am *(Materials Page 24)*	***"A Discussion of the Current State of Public Policy in Washington, DC and Beyond"*** – *Stacey Dion, Managing Director and Head of Global Government Affairs, The Carlyle Group*
11:50 am – 12:15pm	*Break for Lunch*
12:15pm – 1:00pm *(Materials Page 31)*	***2021 Outlook with Henry McVey: "Another Voice"*** – *Henry McVey, Partner & Head of Global Macro & Asset Allocation, CIO of KKR Balance Sheet – Kohlberg Kravis Roberts* – *Rob Sparling, CIO, Dow Inc. (moderator)*
1:00 pm – 1:15 pm	*Break*
1:15 pm – 2:00 pm *(Materials Page 65)* ***DB Committee Session***	***"What considerations does a lower rate environment mean for both DB plans & their sponsors?"*** – *Kevin McLaughlin, Head of Liability Risk Management – North America, Insight Investment* – *Abdallah Nauphal, Chief Executive Officer, Insight Investment*
CIEBA Member Panelists	– *Ernie Caballero, CIO, United Parcel Service* – *Laurence Fulton, CIO, Verizon Investment Management Corporation* – *Liza Scott, Director of Asset Management, Dominion Energy*
2:00 pm – 2:15 pm	*Break*

2:15 pm – 3:00 pm *(Materials Page 99)* ***Investment Committee Session***	***"Asset Allocation in a Low-Yield Environment"*** – *Michael Mendelson, Principal, AQR Capital Management*
CIEBA Member Panelists	– *Jon Glidden, Managing Director - Pensions, Delta Air Lines* – *Heather Oberschmid, Manager – Pension Investments, 3M Investment Management Corporation* – *Dekia Scott, CIO, Southern Company*
3:00 pm – 3:15 pm	*Break*
3:15 pm – 4:00 pm	***Fireside Chat with Josh Friedman*** – *Josh Friedman, Co-Founder, Co-Chairman and Co-Chief Executive Officer, Canyon Partners, LLC* – *Jeff Lewis, Staff Vice President, Retirement Investments, FedEx*
4:00 pm – 4:05 pm	*Concluding Comments*

<u>Wednesday, January 13, 2021</u>

11:00 am – 11:30 am	***Informal Networking Breakout Sessions*** ***---Invitation Only: limited to colleagues and team members of primary CIEBA Member***
11:30am – 11:45am	*Break*
11:45 am – 12:30 pm *(Materials Page 130)*	***Cybersecurity & Fraud Prevention*** – *Tim Rouse, Executive Director, The SPARK Institute* – *Ben Taylor, Senior Vice President, Callan*
12:30 pm – 1:00 pm	*Break for Lunch*

1:00 pm – 1:45 pm *(Materials Page 152)* ***DC Committee Session***	***Pooled Employer Plans – Who Will Be Ready to Take the Plunge?*** – *Liana Magner, US DC Leader, Mercer* – *Preston Traverse, Mid-Market DC Solutions Leader, Mercer* – *Walter Kress, CIO, Ernst & Young (moderator)*
1:45 pm – 2:00 pm	*Break*
2:00 pm – 2:45 pm *(Materials Page 175)*	***CIEBA Public Policy Washington Update*** – *Michael Kreps, Principal, Groom Law Group* – *Dennis Simmons, Executive Director, CIEBA*
2:45 pm – 3:00 pm	*Break*
3:00 pm – 3:45 pm *(Materials Page 188)*	***Eye on the Market 2021 Annual Outlook: The Hazmat Recovery*** – *Michael Cembalest, Chairman of Market and Investment Strategy for J.P. Morgan Asset & Wealth Management*
3:45 pm – 3:50 pm	***Concluding Comments*** *(end of formal CIEBA January 2021 Working Group Meeting)*
4:00 pm – 4:30 pm	***"On-Site" Survey Results*** ***---Invitation Only: limited to registered primary CIEBA Members*** – *Jay Vivian, Secretary, CIEBA (former CIO, IBM)*

CIEBA January 2021
Virtual Working Group Meeting
Attendee List

Registered Member Representatives:

1. Dennis Duerst	3M Company
2. Jolynne Colvin	3M Company
3. Heather Oberschmid	3M Company
4. Eric Rollie	3M Company
5. Jennifer Schmidt	3M Company
6. Nikki Tix	3M Company
7. Jacob Christina	3M Company
8. Ben Bartelt	Advocate Aurora Health
9. Leslie Lenzo	Advocate Aurora Health
10. Ryan Ostrowski	Advocate Aurora Health
11. Paul Cavazos	American Beacon Advisors
12. Kirk Brown	American Beacon Advisors
13. Colin Hamer	American Beacon Advisors
14. Mark Michel	American Beacon Advisors
15. Gene Needles	American Beacon Advisors
16. Mac Owens	American Beacon Advisors
17. Pat Sporl	American Beacon Advisors
18. Cynthia Thatcher	American Beacon Advisors
19. John Lowe	American Beacon Advisors
20. Vanessa Alix	American Beacon Advisors
21. Royn Serrano	American Beacon Advisors
22. Wayne Adams	AT&T Inc.
23. Tom Clemens	AT&T Inc.
24. Gerry Davis	AT&T Inc.
25. Mark Devine	AT&T Inc.
26. Bill Greving	AT&T Inc.
27. Bill Hammond	AT&T Inc.
28. Natasha Malik	AT&T Inc.
29. Dan O'Grady	AT&T Inc.
30. Carl Strutz	AT&T Inc.
31. Michael Zeltser	AT&T Inc.
32. Andrew Ward	Boeing Company
33. Natalie Nadler	Boeing Company
34. Elizabeth Tulach	Boeing Company
35. Thomas Winkelman	Boeing Company
36. Don Kettering	BP America Inc.

37. Lisa Miller	BP America
38. Tammy Babicz	BP America Inc.
39. Patty Sonnenschein	BP America Inc.
40. Candy Khan	BP America Inc.
41. Kevin Stoller	Caterpillar Inc.
42. Marty Rumbold	Caterpillar Inc.
43. Trisha Romero	Caterpillar Inc.
44. Ray Kanner	CIEBA
45. Jay Vivian	CIEBA
46. Alayne Gatti	Comcast NBCUniversal Sky
47. Shirley Cheung	Comcast NBCUniversal Sky
48. Jennifer Neppel	CommonSpirit Health
49. Stephen Fowler	Corning Incorporated
50. Rachel D'Amelio	Corning Incorporated
51. Jennifer Weidright	Corning Incorporated
52. Morgan Shibel	Corning Incorporated
53. Thomas Mercein	Credit Suisse Securities (USA) LLC
54. Joseph Huber	Credit Suisse Securities (USA) LLC
55. Gloria Griesinger	Cummins Inc.
56. Peter Nagel	Cummins Inc.
57. Russell Smith	CVS Aetna Inc.
58. Cary Cassidy	CVS Aetna Inc.
59. Jonathan Glidden	Delta Air Lines
60. Nicholas Alef	Delta Air Lines
61. Dmitriy Voronkov	Delta Air Lines
62. Amanda Cogar	Delta Air Lines
63. Liza Scott	Dominion Energy
64. Mason Antrim	Dominion Energy
65. Alicia Lewis	Dominion Energy
66. Christian Eicher	Dominion Energy
67. Robert Sparling	Dow Inc.
68. Paul Stafford	Dow Inc.
69. Rich Thornton	Dow Inc.
70. Andres Lobo	Dow Inc.
71. Lynn Hendrick	Dow Inc.
72. Angela Buk	DTE Energy
73. Amanda Boggs	DTE Energy
74. Greg Duren	DTE Energy
75. Garrett Goshorn	DTE Energy
76. Maximilian Hintz	DTE Energy
77. Valerie Sill	DuPont Capital Management
78. Lode Devlaminck	DuPont Capital Management
79. Kris Kowal	DuPont Capital Management
80. Antonis Mistras	DuPont Capital Management

81. Elaine Washington	Eastman Chemical Company
82. Constance Booher	Eastman Chemical Company
83. Kevin Wang	Eastman Chemical Company
84. Donny Chia	Eastman Chemical Company
85. Thomas Mucha	Eastman Kodak
86. Nick Johnston	Eastman Kodak
87. Jeffrey Murphy	Eastman Kodak
88. Lin Sun	Eastman Kodak
89. Susan Ridlen	Eli Lilly and Company
90. Anne Marie Christian	Eli Lilly and Company
91. Vicky Erwin	Eli Lilly and Company
92. Michiel Haas	Eli Lilly and Company
93. Shawn Winnie	Eli Lilly and Company
94. Sherry Flick	Eli Lilly and Company
95. Walter Kress	Ernst & Young LLP
96. Joan Perrine	Ernst & Young LLP
97. Carol Chan	Ernst & Young LLP
98. Charles Colfer	Ernst & Young LLP
99. Judy Verbeke	Estee Lauder Companies Inc.
100. Suzana Zayed	Estee Lauder Companies Inc.
101. Douglas Brown	Exelon Corporation
102. Ryan Abrams	Exelon Corporation
103. Brian Anderson	Exelon Corporation
104. Julie Austin	Exelon Corporation
105. Shawn Evans	Exelon Corporation
106. Christopher Gehring	Exelon Corporation
107. Mahdi Hemingway	Exelon Corporation
108. Elizabeth Hlinak	Exelon Corporation
109. Andrew Ierardi	Exelon Corporation
110. Meghan McGuire	Exelon Corporation
111. Phil Stephenson	Exelon Corporation
112. Joyce Pan	Exelon Corporation
113. Jeethu Wolf	Exelon Corporation
114. Raja Vannela	Exelon Corporation
115. Phillip Newman	Exxon Mobil Corporation
116. Hugh Comer	Exxon Mobil Corporation
117. Belen Carreno	Exxon Mobil Corporation
118. Kimberly Hardman	Exxon Mobil Corporation
119. Rowland Henshaw	Exxon Mobil Corporation
120. Trevor Nysetvold	Exxon Mobil Corporation
121. Robert Watson	Fiat Chrysler Automobiles
122. Steven Brinker	Fiat Chrysler Automobiles
123. Gabrielle Casinelli	Fiat Chrysler Automobiles
124. Debbie Kozole	Fiat Chrysler Automobiles

125. Jing Ling	Fiat Chrysler Automobiles
126. Tracy Nanni	Fiat Chrysler Automobiles
127. Chrisine Paoletti	Fiat Chrysler Automobiles
128. Jeff Pickett	Fiat Chrysler Automobiles
129. Danielle Schulte	Fiat Chrysler Automobiles
130. Kurt Simko	Fiat Chrysler Automobiles
131. John Soderstrom	Fiat Chrysler Automobiles
132. Craig Stroup	Fiat Chrysler Automobiles
133. Gary Vahey	Fiat Chrysler Automobiles
134. William Clark	Federal Reserve Employee Benefits System
135. Vejay Bhoopsingh	Federal Reserve Employee Benefits System
136. Jeff Lewis	FedEx Corporation
137. Matthew Daniel	FedEx Corporation
138. Bert Nappier	FedEx Corporation
139. John Hartney	FedEx Corporation
140. Sanjay Chawla	FM Global
141. Reese Green	FM Global
142. Sara Smithson	FM Global
143. Erin Rohde	Ford Motor Company
144. Raymond Prost	Ford Motor Company
145. Sherman Garne	Ford Motor Company
146. Jessica Vila-Goulding	Ford Motor Company
147. Rochelle Dorn-Hayes	Ford Motor Company
148. Harshal Chaudhari	General Electric
149. Greg Boularis	General Electric
150. Katina DeSantis	General Electric
151. Jessica Kerzner	General Electric
152. Vaidheesh Krishnamurti	General Electric
153. Richard Middlebrook	General Electric
154. Stephanie Sarup	General Electric
155. Scott Silberstein	General Electric
156. Dan Stapkowski	General Electric
157. Steve Bowman	General Electric
158. David Holmgren	Hartford HealthCare
159. Kevin Edwards	Hartford HealthCare
160. Daniel Schmitz	Hartford HealthCare
161. Robert Hunkeler	International Paper Company
162. MacPherson Carroll	International Paper Company
163. Carol Tusch	International Paper Company
164. Bruce Van Vleet	International Paper Company
165. Diana Winalski	International Paper Company
166. Craig Wocl	International Paper Company
167. Neil Roache	Johnson & Johnson
168. Donna Barton	Johnson & Johnson

169.	Anna McTigue	Johnson & Johnson
170.	Gbenga Oladeji	Johnson & Johnson
171.	Carolyn Hoenisc	Johnson & Johnson
172.	Paul Colonna	Lockheed Martin
173.	Kathleen Lutito	Lumen Technologies Inc.
174.	Truman Brady	Lumen Technologies Inc.
175.	Matt Brady	Lumen Technologies Inc.
176.	Cheryl Burrell	Lumen Technologies Inc.
177.	Paul Cleverdon	Lumen Technologies Inc.
178.	Mary Beth Gorrell	Lumen Technologies Inc.
179.	Tim Lennon	Lumen Technologies Inc.
180.	John Litchfield	Lumen Technologies Inc.
181.	Shane Matson	Lumen Technologies Inc.
182.	Bruce Rahmig	Lumen Technologies Inc.
183.	Jonathan Rich	Lumen Technologies Inc.
184.	Karen Spinelli	Lumen Technologies Inc.
185.	Paul Strong	Lumen Technologies Inc.
186.	Lance Zeittlow	Lumen Technologies Inc.
187.	Raja Ziady	Lumen Technologies Inc.
188.	Matthew Stroud	Marsh & McLennan
189.	Irene Bondarenko	Marsh & McLennan
190.	Mark Guiler	Marsh & McLennan
191.	Stanislav Nokhrin	Marsh & McLennan
192.	David Palmer	Marsh & McLennan
193.	Joanne Yearwood	Marsh & McLennan
194.	Ferdinand Jahnel	Marsh & McLennan
195.	Umberto Cirri	Nestle
196.	Ashanti Jones	Nestle
197.	Kate Pellicane	Nestle
198.	Brian Arnold	Nestle
199.	Jeanmarie Grisi	Nokia
200.	Scott Deo	Nokia
201.	Drew O'Brien	Nokia
202.	Dennis Newberry	Northrop Grumman
203.	John Szczur	NRECA
204.	Laura Schumann	NRECA
205.	Matthew Bystrowski	NRECA
206.	Justin Sato	NRECA
207.	Akbar Pataudi	NRECA
208.	Jay Laramie	PepsiCo Inc.
209.	Gail Maytin	Prudential Insurance Company of America
210.	Wendy Houston	Prudential Insurance Company of America
211.	Matthew Perna	Prudential Insurance Company of America
212.	Lauren Titus	Prudential Insurance Company of America

213. Robin Diamonte	Raytheon Technologies
214. Thomas Borghard	Raytheon Technologies
215. Georgia Clarke	Raytheon Technologies
216. Joe Fazzino	Raytheon Technologies
217. Bryan White	Raytheon Technologies
218. Kevin Hanney	Raytheon Technologies
219. Angela Williams	Raytheon Technologies
220. Cynthia Hablinski	Shell Oil Co.
221. Jennifer Muse	Shell Oil Co.
222. Eileen Leahy	Siemens Capital Company
223. Avi Grin	Siemens Capital Company
224. Eric Bendickson	Strategic Investment Group
225. David Ordoobadi	Strategic Investment Group
226. Chris Parker	Strategic Investment Group
227. Kendall Rose	Strategic Investment Group
228. Ken Shimberg	Strategic Investment Group
229. Charles Van Vleet	Textron Inc.
230. Eric Carleton	Textron Inc.
231. Keith Watson	Textron Inc.
232. Jim Allison	thyssenkrupp
233. Candice Wimmer	thyssenkrupp
234. Joaquin Boeker	thyssenkrupp
235. Brian Bastien	thyssenkrupp
236. Ernie Caballero	United Parcel Service
237. Larry Fulton	Verizon Investment Management Corp.
238. Stephen Whatley	Walmart
239. Karen Light	Walmart
240. Ruth	Bosco Xerox Corporation
241. Chris Bendlak	Xerox Corporation

Guest Speakers:

Michael Cembalest	J.P. Morgan Asset Management
Stacey Dion	The Carlyle Group
Josh Friedman	Canyon Partners, LLC
Liana Magner	Mercer
Henry McVey	KKR
Kevin McLaughlin	Insight Investment
Michael Mendelson	AQR Capital Management
Abdallah Nauphal	Insight Investment
Tim Rouse	The SPARK Institute
Ben Taylor	Callan
Preston Traverse	Mercer

CIEBA Members: January 2021

3M Company
Abbott Laboratories
Advocate Aurora Health
Aerospace Corporation
Alcoa Inc
Altria Inc
American Airlines
American Beacon Advisors
AT&T Inc
Bechtel Corporation
Berkshire Energy Company
BMW of North America
Boeing Company
BP America Inc
Campbell Soup Company
Canadian National Railway
Caterpillar Inc
Chevron
Citigroup
Comcast NBCUniversal Sky
CommonSpirit Health
Consolidated Edison, Inc
Corning Incorporated
Credit Suisse
CSAA Inc
Cummins Inc
CVS Health (Aetna Inc)
Deere & Company
Delta Air Lines
Dominion Energy, Inc
Dow Inc
DTE Energy Company
DuPont Capital Management
Eastman Chemical Company
Eastman Kodak
Eaton Corporation
Eli Lilly and Company
Emerson Electric Co
Ernst & Young LLP
Estee Lauder Companies Inc
Exelon Corporation
ExxonMobil Corporation
Federal Reserve Employee Benefits System
FedEx Corporation
Fiat Chrysler Automobiles
FM Global
FMC Corporation
Ford Motor Company
General Electric
General Mills, Inc
General Motors Asset Management Corp
Goldman, Sachs & Co
Hallmark Cards Inc
Hartford HealthCare
Hershey Co
Hoffman-La Roche Inc
Honeywell International Inc
Huntington Ingalls Industries, Inc
IBM Retirement Funds
Intel
Inter-American Development Bank
International Paper Company
Johnson & Johnson
Kaiser Permanente
Kellogg Company
KPMG
L3Harris Technologies
Lockheed Martin
Lumen Technologies
Marsh & McLennan Companies Inc
Merck & Co, Inc
MetLife
Michelin North America, Inc
National Grid
Navistar, Inc
Nestle USA
Nokia
Northrop Grumman
Northwestern Mutual Life Insurance Company
NRECA
NRRIT
Otis Worldwide Corporation
Pacific Gas & Electric Corporation
Pactiv Corp
Pentegra
PepsiCo Inc
Pfizer Inc
Procter & Gamble
Prudential Insurance Company of America
Raytheon Technologies
Saint-Gobain Corporation
Shell Oil Company
Siemens Capital Company
Sony Corporation of America
Southern California Edison
Southern Company
Strategic Investment Group
Target Corporation
Textron Inc
ThyssenKrupp, USA Inc
TransCanada Capital Corp
United Parcel Service
United States Steel Corporation
Verizon Investment Management Co
ViacomCBS Inc
Walmart Inc
Wellington Management Co LLP
Wells Fargo Institutional Retirement & Trust
World Bank
Xerox Corporation

CIEBA LEADERSHIP–2021
CIEBA Executive Committee

Officers / Directors:

Chair	Paul Cavazos
Vice Chair	Rob Sparling
Treasurer	Angie Buk
Secretary	Jay Vivian

Directors:

Robin Diamonte
Bob Hunkeler
Ernie Caballero
Carol Tusch
Doug Brown
Alayne Gatti
Elaine Washington
Susan Ridlen
Andy Ward

General Counsel:

Michael Kreps — Groom Law Group

Committee Leadership:

Committee on Defined Benefit Plans

Chair	Ernie Caballero
Vice Chair	Liza Scott
Vice Chair	Larry Fulton

Committee on Defined Contribution Plans

Chair	Alayne Gatti
Vice Chair	Jeff Lewis
Vice Chair	Walter Kress

Committee on Investments

Chair	Susan Ridlen
Vice Chair	Jon Glidden
Vice Chair	Tom Mucha

Committee on International Plans

Chair	Elaine Washington
Vice Chair	Ruth Bosco
Vice Chair	Gloria Griesinger

Committee on Communications / Surveys

Chair	Carol Tusch
Vice Chair	Vicky Lynn Erwin
Vice Chair	Shane Matson

Ex-Officio

Robin Diamonte
Ralph Egizi
Robert Hunkeler
Ray Kanner
Andy Ward
Doug Brown
Jay Vivian

Staff:

Executive Director	Dennis Simmons
Associate Executive Director	Jeanmarie Combe

Future Meeting Dates

2021

January 12 – 13, 2021

Virtual Meeting via Zoom

April 6 – 7, 2021

Virtual Meeting via Zoom

June 22 – 23, 2021

Location TBD

October 19 – 21, 2021

Location TBD

2022

January 11 – 12, 2022

Location TBD

April 5 – 6, 2022

Location TBD

June 21 – 22, 2022

Location TBD

October 18 – 20, 2022

Location TBD

Speaker Biographies
CIEBA Virtual Working Group Meeting
January 2021

Michael Cembalest

Chairman of Market and Investment Strategy for J.P. Morgan Asset & Wealth Management

Michael Cembalest is the Chairman of Market and Investment Strategy for J.P. Morgan Asset & Wealth Management, a global leader in investment management and private banking with $2.6 trillion of client assets under management worldwide (as of September 30, 2020). He is responsible for leading the strategic market and investment insights across the firm's Institutional, Funds and Private Banking businesses.

Mr. Cembalest is also a member of the J.P. Morgan Asset & Wealth Management Investment Committee and previously served on the Investment Committee for the J.P. Morgan Retirement Plan for the firm's more than 256,000 employees.

Mr. Cembalest was most recently Chief Investment Officer for the firm's Global Private Bank, a role he held for eight years. He was previously head of a fixed income division of Investment Management, with responsibility for high grade, high yield, emerging markets and municipal bonds.

Before joining Asset Management, Mr. Cembalest served as head strategist for Emerging Markets Fixed Income at J.P. Morgan Securities. Mr. Cembalest joined J.P. Morgan in 1987 as a member of the firm's Corporate Finance division.

Mr. Cembalest earned an M.A. from the Columbia School of International and Public Affairs in 1986 and a B.A. from Tufts University in 1984.

Stacey Dion

Managing Director and Head of Global Government Affairs, The Carlyle Group

Stacey Dion serves as Managing Director and Head of Global Government Affairs. She is based in Washington, D.C.
Ms. Dion leads Carlyle's global government relations and public policy functions, collaborating with Carlyle senior executives and investment professionals to shape Carlyle's global legislative and regulatory activities.

Ms. Dion joined Carlyle in 2017 as a Managing Director, focusing on U.S. government regulatory and legislative matters. Prior to joining Carlyle, Ms. Dion served as Vice President of Corporate Public Policy for The Boeing Company, where she was responsible for developing and implementing the government relations strategy and tactics on corporate issues including tax, benefits, financial services, corporate governance, energy, environment, workforce training and education.

In her career in government, Ms. Dion was Policy Advisor and Counsel in the Office of the Republican Leader, where she served as lead Republican staff for negotiating and drafting the Economic Stimulus Act of 2008 on behalf of the House Republican Leader Boehner. Prior to that, she served as Tax and Pension Policy Advisor in the Office of the Majority Leader and was responsible for drafting the Pension Protection Act of 2006 and managing the Tax Increase Prevention and Reconciliation Act of 2005. From 2002-2003, Ms. Dion worked in the Employee Benefits Security Administration in the United States Department of Labor, where she developed final regulations, rulings and advisory opinions on ERISA. Ms. Dion began her career in a DC law firm.

Ms. Dion earned her B.A. from Merrimack College and J.D. from The Catholic University of America.

Josh Friedman

Co-Founder, Co-Chairman and Co-Chief Executive Officer, Canyon Partners, LLC

Joshua S. Friedman is Co-Founder, Co-Chairman and Co-Chief Executive Officer of Canyon Partners, LLC, a leading global alternative asset management firm headquartered in Los Angeles, California. Canyon specializes in value-oriented investments for endowments, foundations, pension funds, sovereign wealth funds and other institutional investors. Its investment strategies focus on distressed loans, corporate bonds, convertible bonds, securitized assets, direct investments, real estate, arbitrage, and value equities. Canyon Partners' flagship fund, the Canyon Value Realization Fund, twice received Institutional Investor's "Credit-Focused Hedge Fund Manager of the Year" Award. Additionally, the Canyon Structured Asset Fund received Institutional Investor's "Hybrid Hedge Fund of the Year" Award. Mr. Friedman has also received Institutional Investor's "Lifetime Achievement" Award.

Mr. Friedman is a graduate of Harvard College (1976) (B.A., summa cum laude, Phi Beta Kappa, Physics), Oxford University (1978) (M.A., honors, Politics and Economics, Marshall Scholar), Harvard Business School (1980) (M.B.A., Baker Scholar) and Harvard Law School (1982) (J.D., Sears Prize, magna cum laude). Prior to forming Canyon, Mr. Friedman was Director of Capital Markets for High Yield and Private Placements at Drexel Burnham Lambert. Prior to working at Drexel, he worked in the Mergers and Acquisitions Department of Goldman Sachs in New York.

Mr. Friedman is a member of the Board of Directors of Harvard Management Company. He is also a member of Harvard's Committee on University Resources; the Harvard Business School Board of Dean's Advisors; the Harvard University Campaign Executive Committee; and the Harvard University Task Force on Science and Engineering. Mr. Friedman serves as a Trustee for The Andrew W. Mellon Foundation; the California Institute of Technology (Caltech); Lincoln Center for the Performing Arts; and the Los Angeles County Museum of Art (LACMA). Mr. Friedman is a member of the Investment Committees for The Andrew W. Mellon Foundation, the Broad Foundation, and the J. Paul Getty Trust and chair of the LACMA Finance Committee. He is a member of the Executive Committees for the Los Angeles County Museum of Art (LACMA) and the California Institute of Technology (Caltech).

Mr. Friedman is a former chair of the Investment Committee of the Board of Trustees of Caltech (2013-2019). He also formally served as a Trustee for the Los Angeles Philharmonic (2015-2020). Mr. Friedman also formerly served on the Board of Advisors of the UCLA Hospital Department of Neurosurgery (2009-2020); the UCLA Anderson School of Management (2017-2020); and the California Science Center (2010-2012).

Mr. Friedman and his wife, Beth, live in Los Angeles and have three sons. Mr. and Mrs. Friedman are 2019 recipients of the Ellis Island Medal of Honor.

Michael Kreps

Principal, Groom Law Group

Michael Kreps specializes in issues relating to public policy, fiduciary responsibility, and plan funding and restructuring. He routinely represents both private and public sector clients before federal agencies and Congress.

Previously, Michael served as the Senior Pensions and Employment Counsel for the U.S. Senate Committee on Health, Education, Labor, and Pensions from the 110th through the 114th Congresses. In that role, he managed all aspects of the Committee's retirement agenda and had primary staff responsibility for pension legislation, including the pension investment provisions of the Dodd-Frank Wall Street Reform and Consumer Protection Act, the funding stabilization and Pension Benefit Guaranty Corporation reform provisions of the MAP-21 Act of 2012, the Pension Relief Act of 2010, and the CSEC Pension Flexibility Act. He also led the Committee's oversight of regulatory activities involving employee benefit plans.

Michael writes and speaks frequently on retirement and health policy.

Liana Magner

US Defined Contribution Leader, Mercer

Liana Magner is a Partner in Mercer's Boston, MA office and serves as the Defined Contribution Leader in the US.

Liana has overall responsibility for strategy, development, management and growth of our defined contribution and financial wellness business within the US. Liana continues to be responsible, since 2013, for the ongoing development of Mercer's DC Outsourced CIO unit on a national basis. Her client responsibilities include working with our largest defined contribution plans on both an advisory and delegated basis.

Liana has over 20 years of investment consulting experience, with a specialty in consulting to large DC plan sponsors. Additionally, Liana is a member of our Wealth Leadership Team, Target Date Fund Strategic Research Team, our DC Discretionary Governance Committee, and our National Defined Contribution Investment Committee. Previously, she served on the manager research ratings review committee for nearly ten years.

Prior to joining Mercer in 1998, Liana worked in the investment management industry as a marketing analyst at Quadra Capital Partners, and previously in operations at Boston Investor Services.

Liana has a BA, cum laude, in economics from the University of New Hampshire. She is a CFA® charterholder and a member of the CFA Institute and the Boston Society of Security Analysts.

Henry McVey

Partner & Head of Global Macro & Asset Allocation, CIO of KKR Balance Sheet – Kohlberg Kravis Roberts

Henry H. McVey joined KKR in 2011 and is Head of the Global Macro and Asset Allocation team. Mr. McVey also serves as Chief Investment Officer for the Firm's Balance Sheet, oversees Firmwide Market Risk, and co-heads KKR's Strategic Partnership Initiative (KSPI). As part of these roles, he sits on the Firm's Investment Management & Distribution Committee and the Risk & Operations Committee. Prior to joining KKR, Mr. McVey was a managing director, lead portfolio manager and head of global macro and asset allocation at Morgan Stanley Investment Management (MSIM). Earlier in his career he was a portfolio manager at Fortress Investment Group and chief U.S. investment strategist for Morgan Stanley. While at Morgan Stanley, Mr. McVey was also a member of the asset allocation committee and was the top-ranked asset management and brokerage analyst by Institutional Investor for four consecutive years before becoming the firm's strategist in January 2004. He earned his B.A. from the University of Virginia and an M.B.A. from the Wharton School of the University of Pennsylvania. Mr. McVey is a long-time supporter of the TEAK Fellowship, having recently served as Co-Head of the Board of Trustees for five years. Mr. McVey is also a member of the Pritzker Foundation Investment Committee, a board member of the University of Virginia Investment Management Company (UVIMCO), a member of the national advisory board for the Jefferson Scholarship at the University of Virginia, and a member of the Council on Foreign Relations. Mr. McVey also serves as a member of the Financial Sector Advisory Council for the Federal Reserve Bank of Dallas and on the Trade Commission at the Center for Strategic and International Studies (CSIS) in Washington, DC.

Kevin McLaughlin

Head of Liability Risk Management – North America, Insight Investment

Kevin is based in Insight's New York office and works on the design and delivery of investment solutions tailored to address client-specific risk, return and strategy objectives. He joined in August 2016 from Deutsche Bank where he was Head of Pension Advisory in the US investment banking division, specializing in financial risk solutions and corporate pension strategy. Prior to this, Kevin worked at Mercer where he was a founding member of the Financial Strategy Group, focusing on liability-driven investment strategies and pension risk defeasance programs. He started his career in Dublin and has subsequently worked in Brussels and London before moving to New York in 2010. Kevin holds a bachelor's degree in actuarial and financial studies, is a Fellow of the Institute of Actuaries (FIA), holds a Charter in Financial Analysis as well as an MBA from the Instituto de Empresa, Madrid. He additionally maintains a Series 3 license and is an Associated Person with the National Futures Association.

Michael Mendelson

Principal, AQR Capital Management

Michael Mendelson is a Principal, portfolio manager and member of the Executive Committee of AQR Capital Management. Michael has managed both equity and macro strategies and has been active in developing AQR's investment infrastructure, organizing its risk management efforts, overseeing portfolio financing and leading the effort to better serve the senior leaders of our strategic clients. Prior to AQR, he was the founder of the Quantitative Trading department at Goldman, Sachs & Co. Michael is a member of the Board of Governors of the Investment Company Institute. He has also served as a member of the Managed Funds Association's board of directors and Chairman of its Trading and Markets Committee and its Government Affairs Committee. Michael earned an SB in mathematics, an SB in management, an SB in chemical engineering and an SM in chemical engineering, all from the Massachusetts Institute of Technology, and an MBA from the University of California at Los Angeles.

Abdallah Nauphal

Chief Executive Officer, Insight Investment

As Chief Executive Officer (CEO), Abdallah leads the development of Insight's strategic business plan. Abdallah was appointed Chief Investment Officer (CIO) in September 2003 with overall responsibility for the investment management team, and in June 2006 was appointed Deputy Chief Executive. In July 2007, Abdallah became Insight's CEO, while retaining his position as CIO. Abdallah has over 25 years' industry experience. He has overseen the transformation of Insight from a traditional investment manager to a specialist solutions provider across LDI, fixed income and absolute return. During this time, the scope and complexity of Insight's business and governance structures has evolved significantly. As a result, in 2016, Abdallah relinquished his CIO responsibilities, to focus on the role of CEO. Abdallah's previous roles include CIO (fixed income) at Rothschild Asset Management and Head of Fixed Income for Schroder Investment Management Limited in London. Abdallah holds a Bachelor degree in Business Administration from New England College, an MS in Information Systems and an MBA in Finance and Investments from George Washington University. Abdallah also holds his Series 3 license and is an Associated Person with the National Futures Association.

Tim Rouse

Executive Director, The SPARK Institute

Tim has over thirty-five years of experience in the financial services industry mainly within retirement services of large mutual fund companies. For the past twenty-five years Tim has worked with major plan sponsors in state and local governments, corporations, Taft-Hartley plans, nonprofit hospitals, colleges, and universities. Over his career Tim has worked with Voya Financial, Fidelity Investments, ICMA Retirement Corporation and The Vanguard Group.

Tim is a former President of the National Association of Government Defined Contribution Administrators' Industry Board and a graduate of Villanova University.

Dennis Simmons

Executive Director, CIEBA

Dennis Simmons is the Executive Director of CIEBA, the Committee on Investment of Employee Benefit Assets. CIEBA represents more than 100 of the country's most experienced chief investment officer fiduciaries, with CIEBA Members managing over $2 trillion of defined benefit and defined contribution plan assets.
Prior to joining CIEBA in 2017, Mr. Simmons led global retirement savings public policy strategy as senior principal in the International Legal team at Vanguard. In that role, Mr. Simmons worked through Vanguard’s global regional offices in London, Brussels, Paris, Hong Kong, Beijing, Melbourne, Toronto, and Latin America, leading Vanguard’s efforts in shaping global retirement savings policies and initiatives.

Prior to leading international retirement savings policy strategy at Vanguard, Mr. Simmons served for over ten years as Vanguard’s lead ERISA counsel, heading Vanguard’s ERISA Legal and Fiduciary Services Group and Vanguard’s Plan Sponsor Strategic Consulting Group. Mr. Simmons also served as lead counsel on boards and committees responsible for Vanguard’s trustee services and the design and administration of global retirement and health and welfare programs, including programs benefitting Vanguard’s 15,000+ employees.

Mr. Simmons has been handling global retirement savings policy, tax, and legal issues for over two decades and he is a frequent conference speaker on retirement savings matters. He has been active on legislative committees for prominent retirement savings industry groups, such as the American Benefits Council, the Defined Contribution Institutional Investment Association, the Plan Sponsor Council of America, and the Investment Company Institute (ICI), serving as the past Chairman for both ICI’s Global Retirement Savings Committee and ICI’s US Pension Committee.

Mr. Simmons also served on the US Department of Labor’s ERISA Advisory Council, the council established under U.S. federal law to give recommendations to the Secretary of Labor on important policy issues affecting retirement savings and welfare plans.

Mr. Simmons earned a B.A. in economics and a BS in business administration from Roanoke College, and a J.D., *cum laude*, from Widener University School of Law.

Ben Taylor

Senior Vice President, Callan

Ben Taylor is a senior vice president and head of tax-exempt defined contribution (DC) research. Based in Los Angeles, Ben serves as a lead consultant to DC plans and primarily focuses on public sector DC plans, ranging from 457(b) plans to single and multi-vendor 403(b)/401(a) and 401(k) plans. He also conducts specialized research for DC plans. Ben is a shareholder of the firm.

In his career, he has served as the consultant to the DC plans of 12 states, and many large cities and universities. He also taught economics at Harvard University, where he received an award for excellence in teaching. He is past president of NAGDCA's Industry Committee and served on the NAGDCA Board. He serves as vice chairman of the Public Retirement Research Library and is vice chairman of the SPARK Data Security Oversight Board. Ben has been published by Oxford University Press and is one of the co-authors of *The Disruptive Impact of FinTech on Retirement Systems.*

Ben earned a BA from Reed College, a master's of international political economy and development from Fordham University, and a master's of public policy from Harvard University's Kennedy School of Government.

Preston Traverse

Mid Market DC Solutions Leader, Mercer

Preston Traverse is currently a Partner in the Defined Contribution Segment since September 2018. Prior to this position, he was Chief Operating Officer for the DC & Financial Wellness group within Mercer Investment Management since March of 2016. The DC & Financial group focusses on defined contribution and financial wellness advice and solutions for companies within the United States.

Prior to joining Mercer, Preston was Global Head of Marketing and Product Management. He had overseen product management and development since The Boston Company in 2006. In addition, he assumed oversight of the Marketing/E-Business group and the Communications, Media and RFP team in 2013. Preston also was chair of the Product Committee, which determined overall product strategy as well as specific product capabilities.

Prior to joining The Boston Company, Preston held product management and development positions at Mellon Asset Management, where he worked from 2004 to 2006, and Fleet Bank/Bank of America, where he worked from 1998 to 2004. In these roles, he was responsible for the development of legal structures and delivery vehicles for investment management capabilities; the creation, design and implementation of new products; and the launch of collective funds, hedge funds and mutual funds. Previously, he worked as a Client Service Manager at Boston Financial Data Services from 1996 to 1998 and as a Mutual Fund Representative at Scudder, Stevens & Clark, Inc., from 1992 to 1994.

Preston received a BA in History from Denison University and an MBA from Boston University.

POLICY OUTLOOK: FORECASTING POTENTIAL POLICY ACTIONS UNDER A DEMOCRATIC GOVERNMENT

GLOBAL GOVERNMENT AFFAIRS

JANUARY 2021

THE CARLYLE GROUP

Potential Policy Changes Requiring Legislative or Executive Action

Tax Policy	Process	Likelihood
Increase GILTI Tax from 10.5% to 21%	Congressional legislation required	Y
Tighten international tax rules by applying the foreign tax credit limitation on a per-country, rather than worldwide basis.	Congressional legislation required	Y
Impose 15% minimum tax on book profits in excess of $100MN (AMT structure)	Congressional legislation required	Low probability
Increase the statutory corporate tax rate to 28%	Congressional legislation required	Y
Increase the Pass Through rate on certain income currently eligible for the 20% deduction (which reduces tax rate to a maximum of 29.6%)	Congressional legislation required	Y
Increase the individual marginal tax rate from 37% to 39.6%	Congressional legislation required	Y
"Ultra-millionaire Tax" on net worth over $50 mil	Congressional legislation required	Y
Tax capital gains at ordinary income tax rates. Eliminates step up basis	Congressional legislation required	Y
Change tax treatment of carried interest	Debated whether can be done via regulation or if legislation required	Y (unnecessary if above changed)
Impose a 12.4% SS payroll tax (split between ER and EE) on income above $400K)	Congressional legislation required	Y
Repeal the SALT limitation	Congressional legislation required	Y
Real Estate-eliminate like kind exchanges	Congressional legislation required	Y
Real Estate-eliminate ability to offset income with real estate losses	Congressional legislation required	Y
Energy-Eliminate all credits/deductions related to extraction and production of fossil fuels	Congressional legislation required	Y
Modify and extend wind PTC and solar ITC	Congressional legislation required	Y
Eliminate tax deduction for traditional retirement contributions	Congressional legislation required	Low Probability
Tax unrealized gains using mark-to-market accounting	**Congressional legislation required**	Y

Potential Policy Changes Requiring Legislative or Executive Action

Trade Policy	Process	Likelihood
Establish clawback legislation forcing companies to repay public investment and tax incentives if they outsource jobs	Congressional legislation required	Y
Establishment of carbon adjustment fees levied against countries failing to meet environmental obligations	Congressional legislation required	Y
Release draft negotiating agreements to the public	Executive Authority	Possibly
Enhance congressional review process	Executive Authority	Y
Labor and environment enforcement mechanisms	Executive Authority	Y
U.S.-China Policy	**Process**	**Likelihood**
Cooperate with China on climate change and nuclear proliferation	Executive Authority	Y
Work with allies to confront China; apply trade and foreign policy principles	Executive Authority	Y
Pressure China on Hong Kong policy	Executive Authority	Y
Maintain bans on use and incorporation of certain telecommunications equipment	Executive Authority	Y

Potential Policy Changes Requiring Legislative or Executive Action

Labor	Process	Likelihood
Blacklist federal government contracts for violations of certain labor laws	Executive Authority	Y
Reorganize employment-related agencies and programs in federal government with new Department of Economic Development tasked with producing a quadrennial National Jobs Strategy	Congressional legislation required	Y
Raise federal minimum wage to $15/hour	Congressional legislation required	Y
Change independent contractor/gig-economy worker classification	Executive Authority and congressional legislation required	Y
Boardroom representation and choice; employee seats on boards of companies with more than $1 bil in annual revenue	Congressional legislation required	Y
Institute option of a card check system in union organization	Congressional legislation required	Y
Enact stricter rules on state unemployment insurance agencies related to the types of employees that can be drug tested	Congressional legislation required	Y
Modify fiduciary rules to encourage impact investing	Executive Authority	Y
Enact mandatory paid family leave	Congressional legislation required	Y
Revisit Joint Employer Rule and bring back Obama Era Rules	Executive Authority	Y

Potential Policy Changes Requiring Legislative or Executive Action

Healthcare	Process	Likelihood
Strengthen ACA marketplace protections	Executive Authority and congressional legislation required	Y
Medicare for All	Congressional legislation required	Low probability
Public Option/Medicare earlier age buy-in	Congressional legislation required	Y
International Drug Pricing index; drug reimportation	Executive Authority	Y
Allowing the government to negotiate drug prices for Medicare	Congressional legislation required	Y
HHS to manufacture generic drugs in select case	Congressional legislation required	Low probability
Spend $100 bil+ over ten years to address opioid crisis	Congressional legislation required	Y

Energy and Environment	Process	Likelihood
Ban fracking on federal lands and public lands	Executive Authority	Y and tighten license renewals
$3 tril clean energy stimulus package, which includes $2 tril plan focused on green research, manufacturing, and exporting	Congressional legislation required	Y
End oil/gas leasing/new permits on public lands	Executive Authority	Y
Reinstate the methane pollution rule	Executive Authority	Y
Reinstate clean water rule	Executive Authority	Y
Require publicly traded companies to disclose payments made to governments for the commercial development of oil, natural gas, or minerals	Executive Authority	Y
Implement stricter anti-contamination requirements on coal producers utilizing strip mining techniques	Executive Authority	Y
Tighten procedures used to prepare, revise, or amend land use plans for federal lands	Executive Authority	Y

Potential Policy Changes Requiring Legislative or Executive Action

Technology	Process	Likelihood
Break up big tech with existing regulation/legal tools to reverse mergers	Executive Authority	Possibly
Designate select large tech companies with over $25 bil in annual revenue as "platform utilities" and prohibit them from owning the platform and any participants on it as well as data sharing with third parties	Congressional legislation required	Y
Restore Net Neutrality	Executive Authority	Y
Create Office of Broadband Access to manage new federal grants program	Congressional legislation required	Possibly
Implement regulations requiring internet service providers to obtain affirmative consent or "opt-in" from every individual user before colleting and using information for any purpose, including the placement of contextual advertising.	Executive Authority	Y
Anti-Trust	**Process**	**Likelihood**
Increased congressional and Administration scrutiny of M&A activity and likely more federal anti-trust actions and lawsuits.	Executive Authority	Y
Possible use of anti-trust laws to break up Big Tech companies	Executive Authority	Possibly
Housing	**Process**	**Likelihood**
Scrutiny of Single Family Residential	Executive Authority and Congressional Oversight	Y
Scrutiny of Manufactured Housing	Executive Authority and Congressional Oversight	Y
Extension of eviction moratorium	Executive Authority and congressional legislation required for non-federally backed mortgages	Y

Potential Policy Changes Requiring Legislative or Executive Action

Banking and Finance	Process	Likelihood
Make PE fiduciaries to LPs on underlying investments	Congressional legislation required	Y
Empower CFPB to ban mandatory arbitration clauses	Executive Authority	Y
Make PE responsible for debt of companies they buy	Congressional legislation required	Y
Limit terms on loans to PE-owned companies	Congressional legislation required; Executive Authority may be possible	Y
Break up large banks, rebuild wall between commercial and investment banking using Dodd-Frank and/or legislation with new version of Glass-Stegall legislation	Executive Authority and congressional legislation required	Y
Strengthen rules regarding capital, liquidity, leverage, and resolution-planning for big banks	Executive Authority	Y
Cancel student debt	Congressional legislation required	Y
Monitor and reduce leverage lending (e.g., reinstitute leveraged lending guidance)	Executive Authority	Y
Repeal revised Volcker Rule	Executive Authority	Y
Impose 5% Risk Retention for CLOs	Congressional Legislation Required	Y
Repeal FSOC Activities-Based Approach to SIFI Designation back to specific entity	Executive Authority	Y
Repeal SEC Rules on Proxy Advisors	Executive Authority	Y
Repeal SEC's Harmonization of Exempt Offering including updated accredited investor definition	Executive Authority	Y
Repeal DOL Regulation Best Interest	Executive Authority	Y
SEC disclosure on Board Diversity	Executive Authority; congressional legislation required	Y
Rescind DOL Guidance on use of PE investments in 401(k) and DC plans	Executive Authority	Y
Rework or re-propose rule on financial factors in selecting plan investments	Executive Authority	Y
Revisit CFPB Pay Day Lending Rules to Strengthen them	**Executive Authority**	Y
Reexamine Bipartisan 2018 Banking Bill	Congressional Legislation Required	Y
Prohibit Dividend Recapitalizations	**Executive Authority**	Y

KKR Macro Update : Another Voice

January 2021

Henry H. McVey

KKR

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Key Conclusions

Overall Observations	Top-Down Themes

Overall Observations

- Our Square Root Recovery Will Translate into Stronger Growth by 2022
- Global Savings Will Encourage the Consumer to Spend
- Rates Have Bottomed, While Inflation Will Be a Lagging Indicator
- Stay Invested, But We Are at an Inflection Point for ‘Traditional’ Asset Allocation

Top-Down Themes

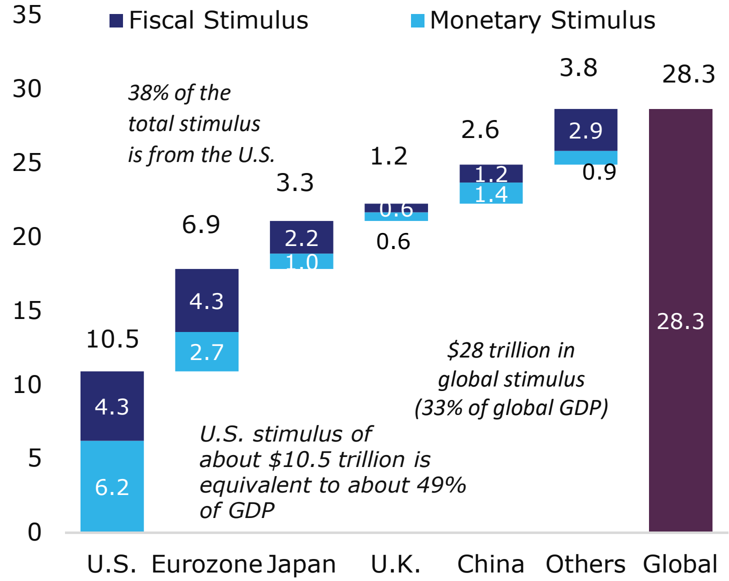
- Collateral-based Cash Flows
- Rise of the Global Millennial
- Embrace Dislocation and Dispersion
- Secular Winners/Innovation
- Fiscal Beneficiaries, Including ESG
- Intensifying Domestication

Section I: Global Growth Trends

Record Global Stimulus, With the U.S. Government Leading the Charge

29% of Global GDP Worth of Stimulus to Battle COVID-19

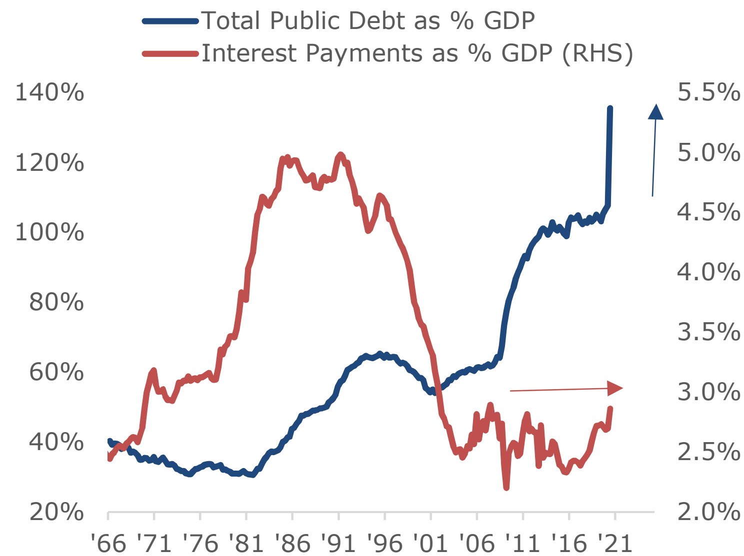
Global Stimulus in Response to Covid-19, US$ Trillion



As at November 2020. Source: Cornerstone Macro, https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19.

So Far, the Stimulus Does Not Actually Cost That Much

U.S. Debt and Interest Payments as a % of GDP



Data as at September 30, 2020. Source: US Treasury, Haver Analytics.

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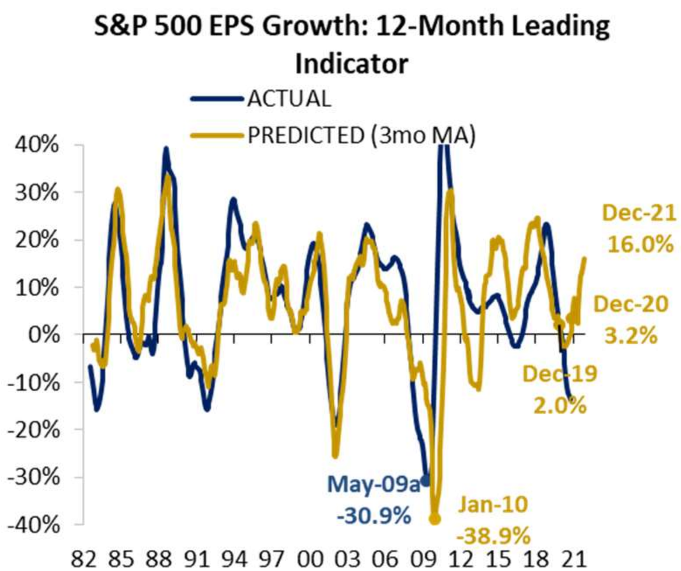
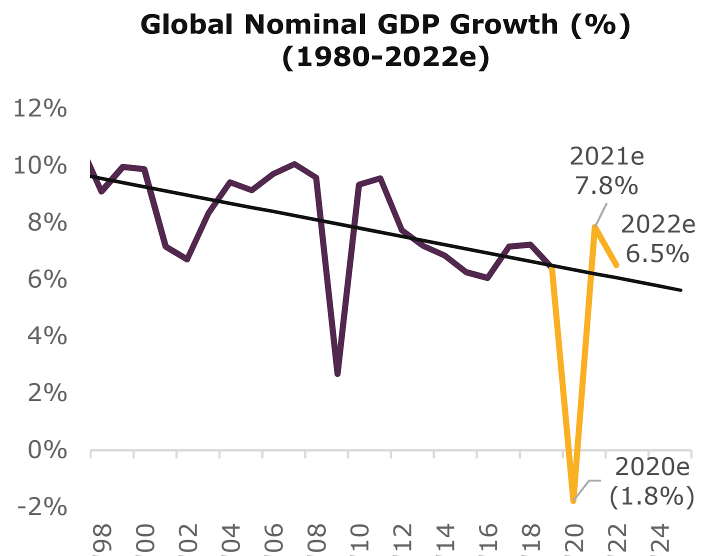
Our Longer-Term Models Are Suggesting Faster Nominal GDP Growth by 2022

Our Earnings Growth Leading Indicator Suggests a Massive Rebound in Growth in 2021



The Earnings Growth Leading Indicator (EGLI) is a statistical synthesis of seven important leading indicators to S&P 500 Earnings Per Share. Henry McVey and team developed the model in early 2006. a = Actual; p = model predicted. Data as at November 15, 2020. Source: KKR Global Macro & Asset Allocation analysis, Bloomberg.

Growth in the 2021-2022 Period Could Feel Like the Good Old Days



Data as at September 30, 2020. Source: US Treasury, Haver Analytics.

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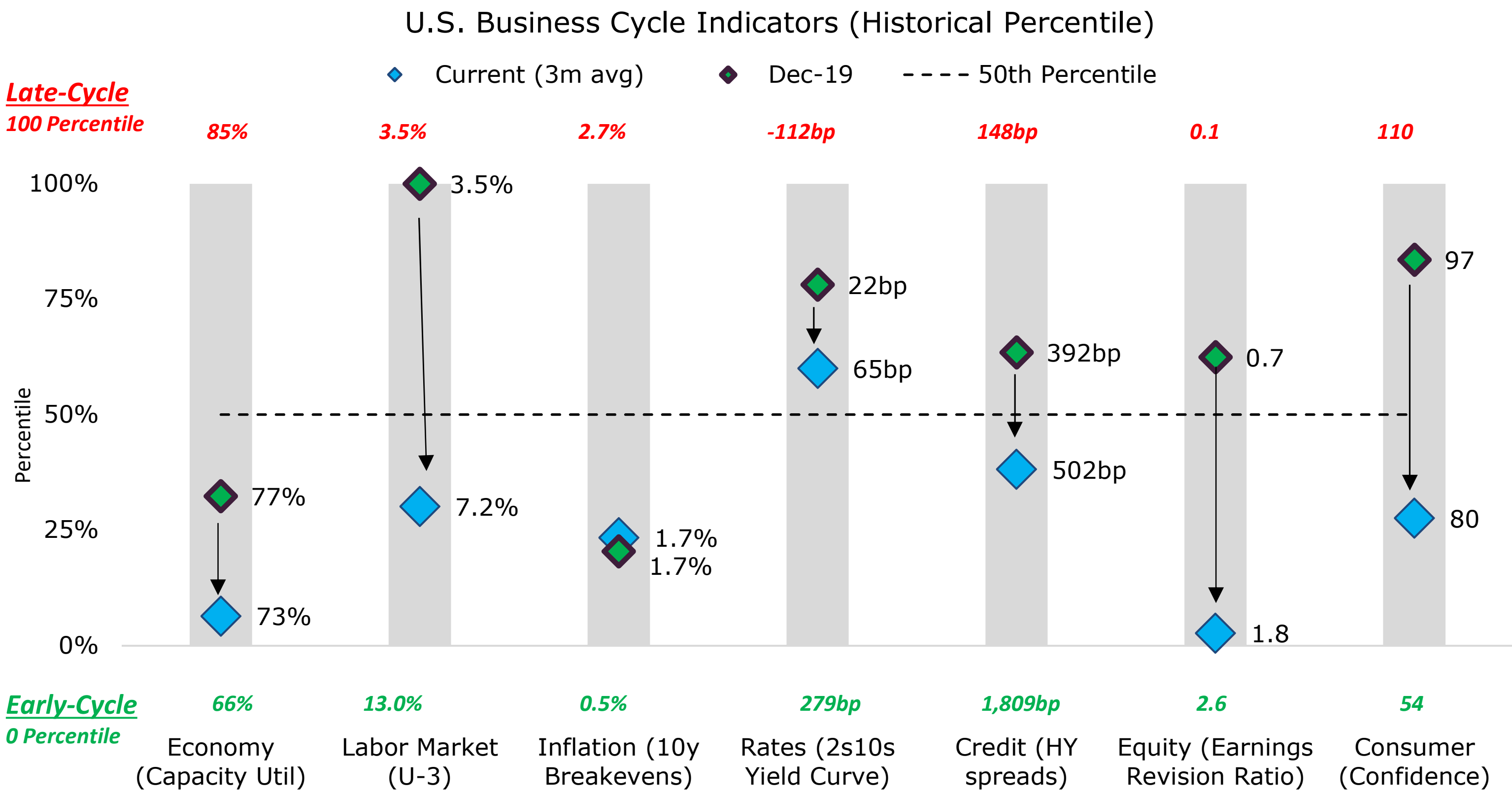
Importantly, Many Business Indicators Support Our View That We Are Largely Early Cycle

The U.S. Economy Was Relatively Late-cycle by December 2019 (Green Dots). However, the Pandemic/Recession Has Reset Most of the Indicators Back Towards Early-cycle



Data as at December 31, 2020. Source: Bloomberg, GMAA analysis, Haver analytics.

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Section II: The Consumer

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The Overall Health of the Consumer — in Aggregate – Appears Quite Favorable

There Is Enough New Stimulus to Support Continued Expansion of Disposable Incomes in 2021

	Monthly Avg. Disp. Pers. Inc. per Household	Private Sources[1]	Baseline Gov't Social Benefits (Incl. Auto Stabilizers)	Supplemental Public Sources
		U.S. Dollars		
2019	**11,087**	8,968	2,120	0
2020e	**11,428**	8,341	2,421	666
Base 2021e ($1.1tr. Stimulus)[2]	**11,555**	8,916	2,329	310
Upside 2021e ($1.75tr, Under Dem. Senate)	**11,984**	8,916	2,329	738
		Contribution to Total DPI Growth		
2020e	**3.1%**	-5.7%	2.7%	6.0%
Base 2021e ($1.1tr. New Stimulus)[2]	**1.1%**	5.0%	-0.8%	-3.1%
Upside 2021e ($1.75tr, Under Dem. Senate)	**4.9%**	5.0%	-0.8%	0.6%

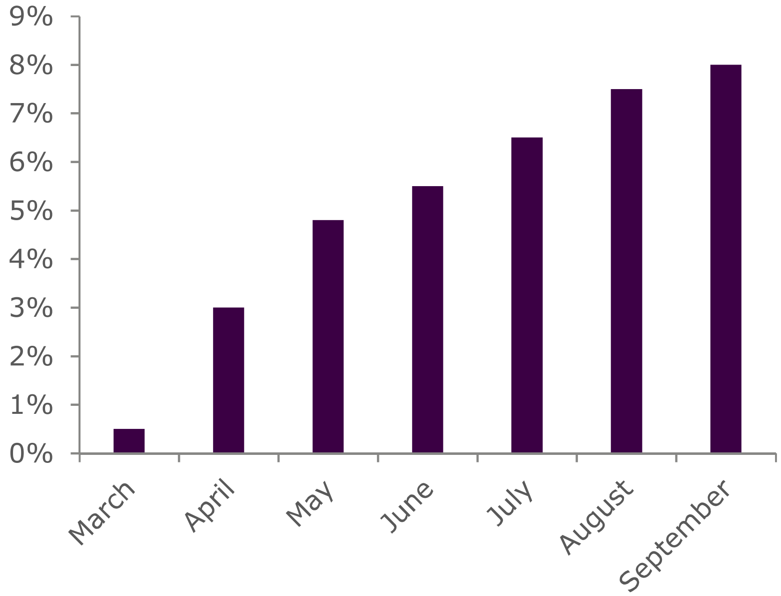
1. Income from private sources excludes employment income funded via PPP
2. Base case $1.1tr stimulus assumption includes $900bn from Phase IV fiscal package passed Dec'20 and ~$200bn from further extension of supplemental unemployment payments that currently sunset in Mar'21

Note: Baseline benefits are regular government assistance programs that are already in place. Supplemental are pandemic-specific programs – mostly those introduced by the CARES act. Upside case assumes a further $650bn of spending related to additional stimulus checks (taking nominal amount to $2000 from $600), new state & local aid, and infrastructure spending. Data as at January 1, 2021. Source: Bureau of Economic Analysis, GS Investment Research, KKR Global Macro & Asset analysis.

The Amount of Excess Savings Could Be a Signal for Strong Future Demand

Households Have Accumulated a Significant Amount of Savings Through the Recession

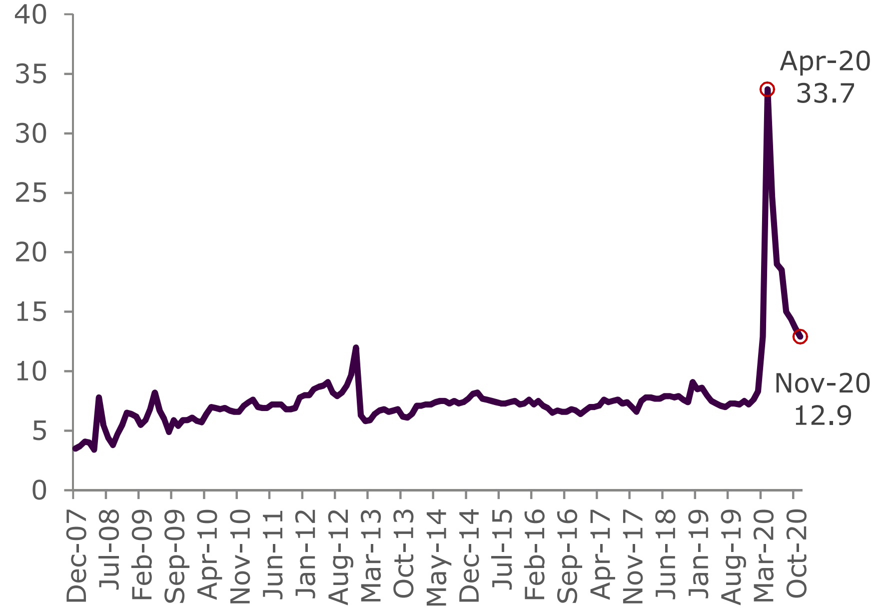
Cumulative Excess Savings as a % of 2019 PCE



Excess Savings = Savings above counterfactual level projected from February (based on realized savings growth over 2018-2019). Data as at September 30, 2020. Source: Department of Commerce, Goldman Sachs.

The U.S. Savings Rate is Still High. As It Falls, It Will Bolster Consumption

Personal Savings as a % of Disposable Income



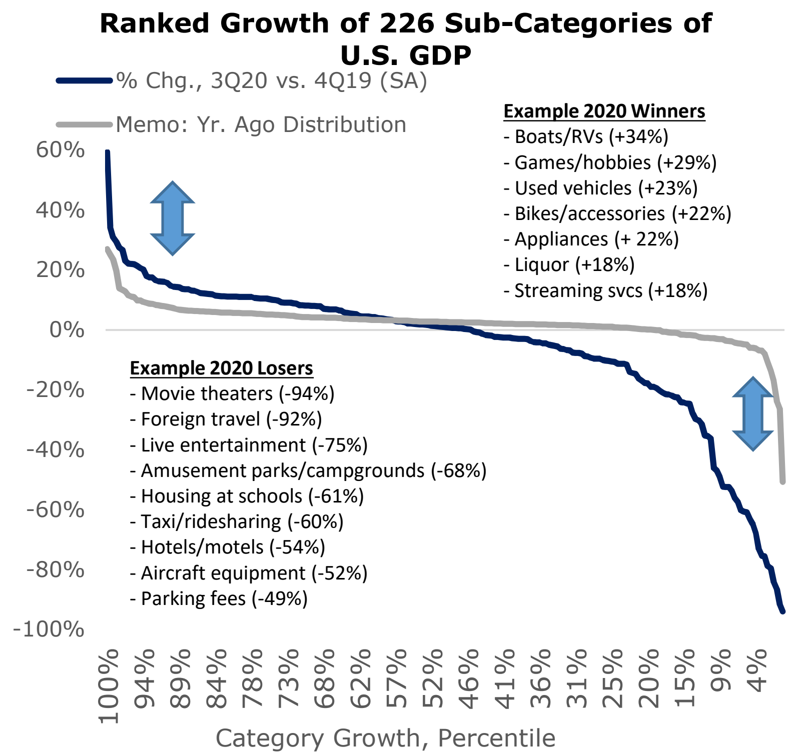
Data as at November 30, 2020. Source: China Bureau of Statistics, Haver Analytics.

An Economic "Catch-Up" Is Likely, the Magnitude of Which May Be Underestimated

U.S. Inventories Are Too Low As the Recovery Has Been Better than Expected

Data as at September 30, 2020. Source: EvercoreISI.

2020 Has Been a Year of Extremes on Both the Downside and the Upside. Going Forward, Mean Reversions Seem Likely



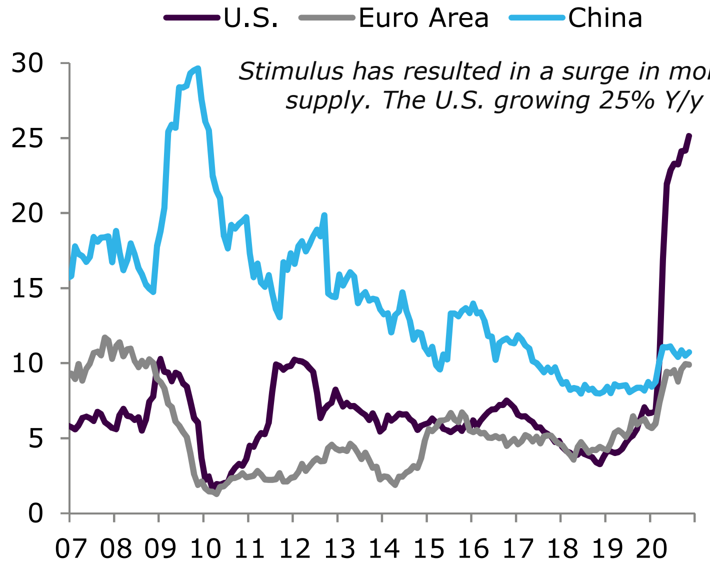
Data as at November 17, 2020. Source: BEA, Haver Analytics, KKR Global Macro & Asset Allocation analysis

Section III: Central Banks and Inflation

Money Supply Is Up, But the Money Multiplier, Which We Think Is the Key, Has Actually Gone Down in the DM

The U.S. Money Supply Is Booming, But…

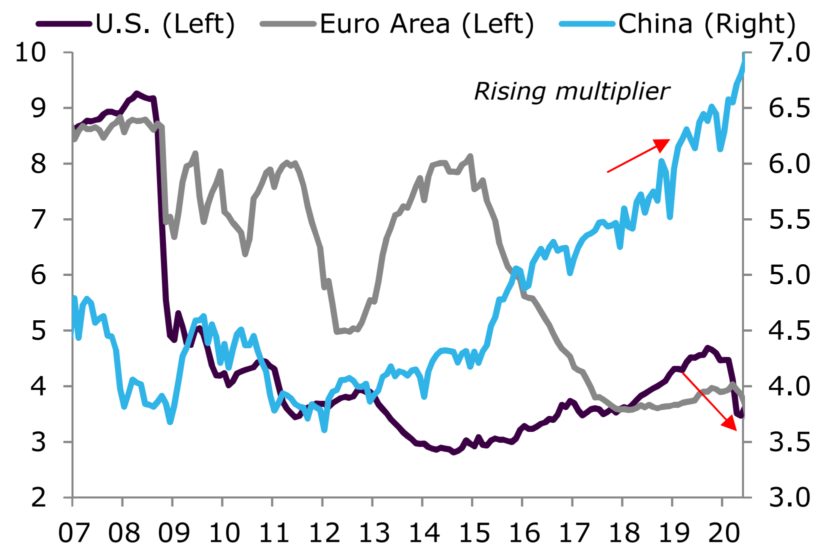
M2 Money Stock Growth Y/y (%)



Data as at November 30, 2020. Source: BEA, Federal Reserve, Haver Analytics.

…The Money Multiplier Is Not. We Expect It to Remain Sluggish in the Near-Term

Money Multiplier (M2/Monetary Base)



Data as at November 30, 2020. Source: BEA, Federal Reserve, Haver Analytics.

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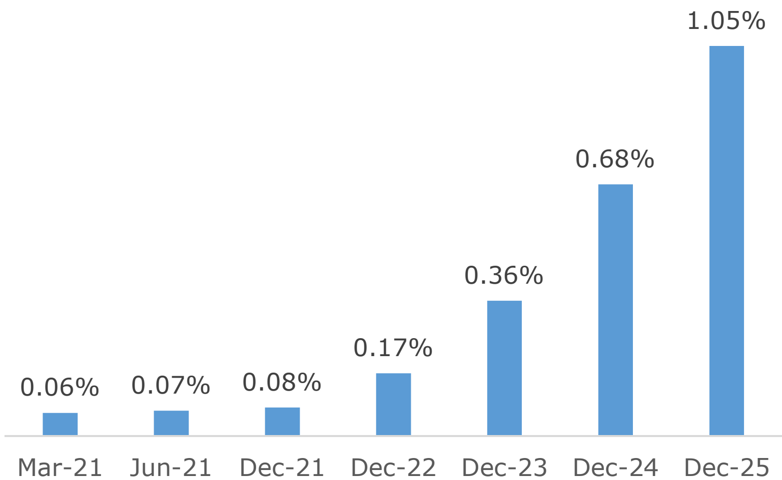
The Market Expects the Fed to Remain Extremely Dovish, Despite Negative Real Rates

The Market Anticipates Steadfast Dovishness From the Fed, Which Means Powell Essentially Must Remain Dovish to Avoid a Taper Tantrum

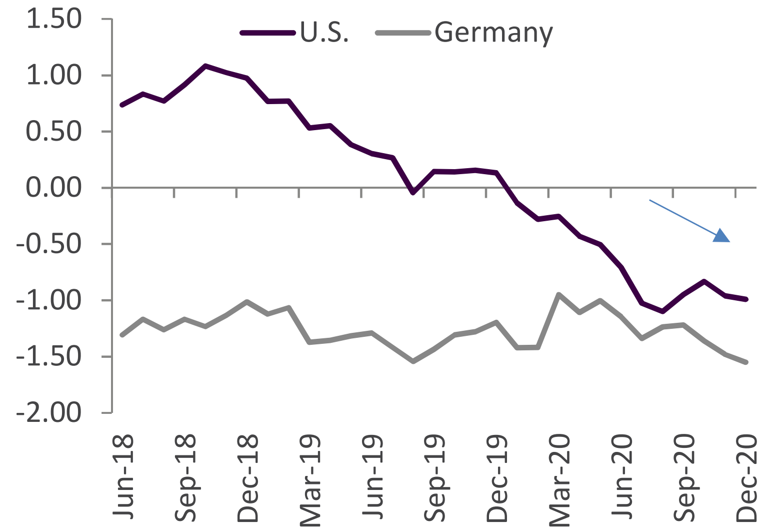
Fed Funds Expectations (1-Month OIS Forwards as of January 2021)



Data as at December 30, 2020. Source: Bloomberg.

U.S. Real Rates Have Crashed Into Negative Territory, Converging With European Levels

Real 10-Year Yield Implied by Inflation Indexed Bonds, %



Data as at December 31, 2020. Source: Bloomberg.

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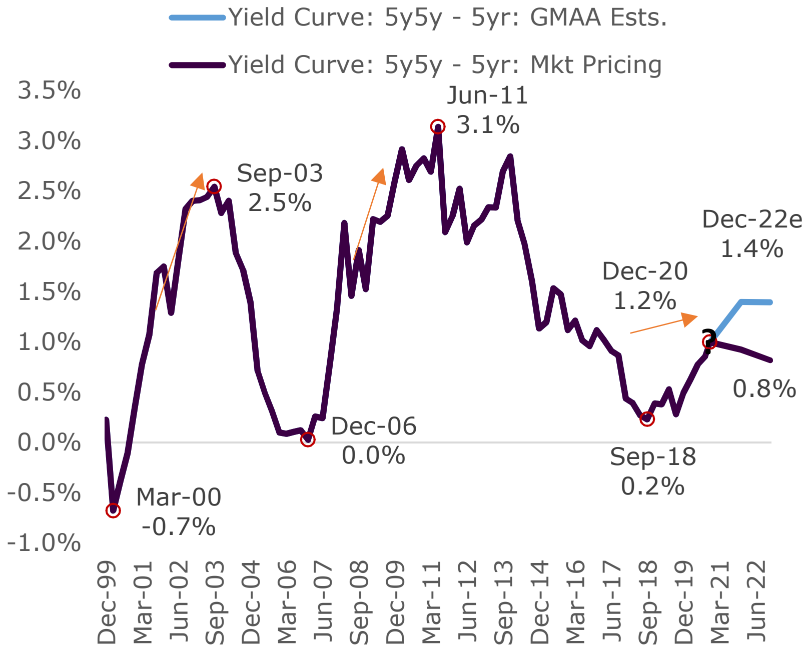
We Think That CIOs Will Want and Need More Inflation Protection

We Expect More Curve Steepening Than What Is Currently Priced In

Back End (5y5y) vs. Front End (5y) of U.S. Yield Curve Through Cycles



e = KKR GMAA estimates. Data as at November 30, 2020. Source: Bloomberg, KKR Global Macro & Asset Allocation analysis.

Pulling the Pieces Together, We Target a 10-year Yield of 1.25% in 2021 and 1.5% in 2022

	Market Pricing			GMAA Estimates		
	10-Yr Yield	**5-Yr Yield**	**5Y5Y Fwd**	**10-Yr Yield**	**5-Yr Yield**	**5Y5Y Fwd**
Dec-20	0.9%	0.4%	1.5%	**0.9%**	0.4%	1.5%
Dec-21e	1.1%	0.6%	1.6%	**1.25%**	0.6%	2.0%
Dec-22e	1.3%	0.9%	1.7%	**1.5%**	0.9%	2.3%

e = KKR GMAA estimates. Data as at December 31, 2020. Source: Bloomberg, KKR Global Macro & Asset Allocation analysis.

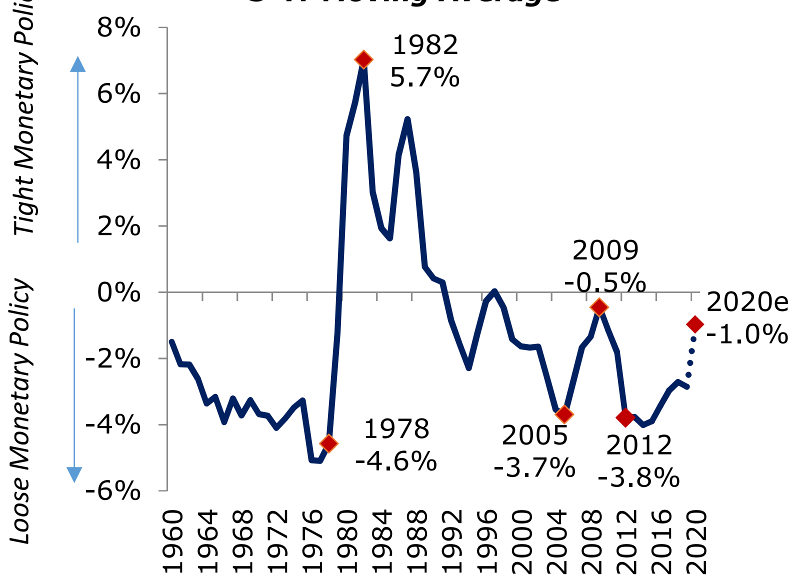
Section IV: Key Themes

KKR

#1: The Fed Is Clearly in 'Do Whatever It Takes Mode' to Stoke Some Inflation. This Approach Drives Our Desire to Own Collateral-Based Assets With Cash Flow

The Strategy to Reflate Is Based on Holding Nominal Interest Rates Below Nominal GDP

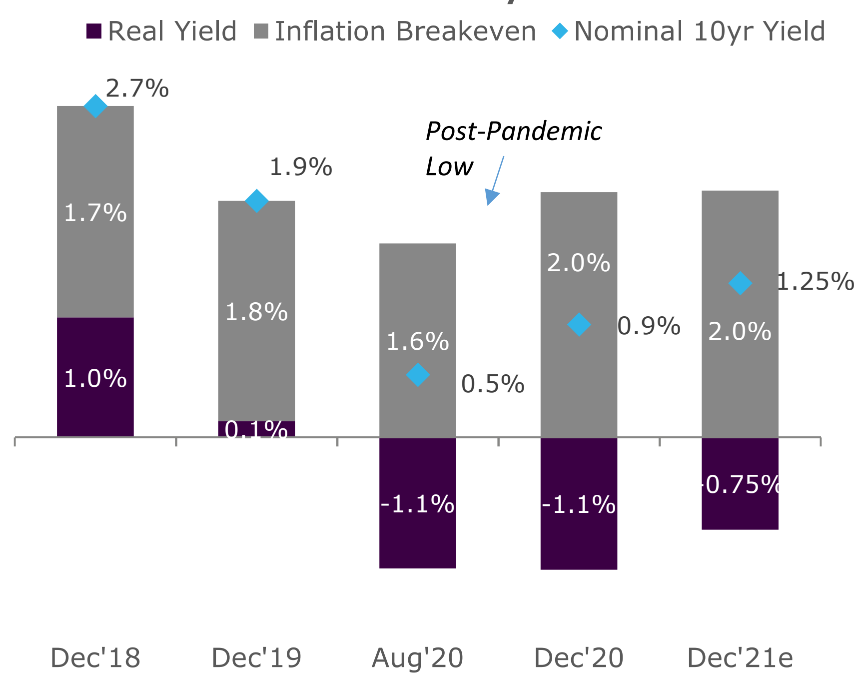
U.S. Fed Funds Rate, % Points Above/(Below) U.S. Nominal GDP Growth
3-Yr Moving Average



Data as at September 30, 2020. Source: BEA, Federal Reserve, Haver Analytics.

Record Stimulus by the Federal Reserve and Treasury Are Finally Lifting Inflation Expectations

U.S. 10-Yr Treasury Yield



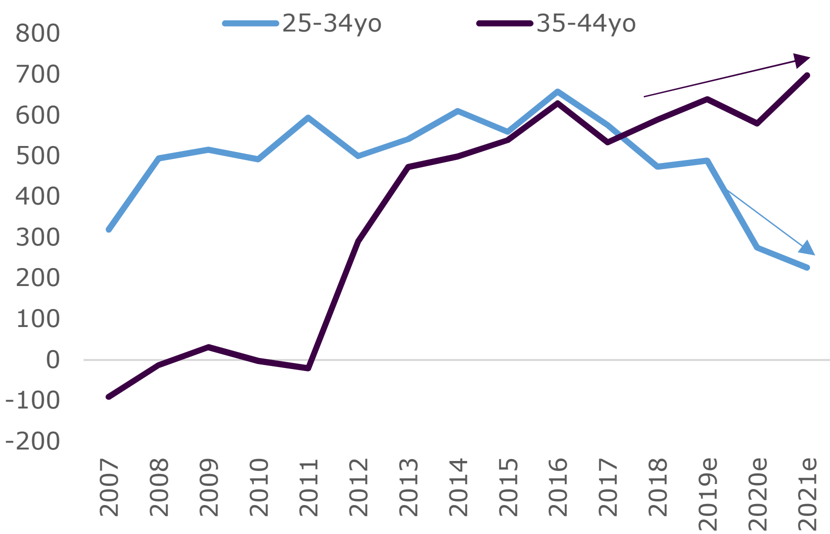
Data as at December 8, 2020. Source: Bloomberg.

#2: Rise of Global Millennial: Demographics Have Become Destiny

U.S. Millennials Are Now Aging Into Their Prime Household Formation and Expansion Years

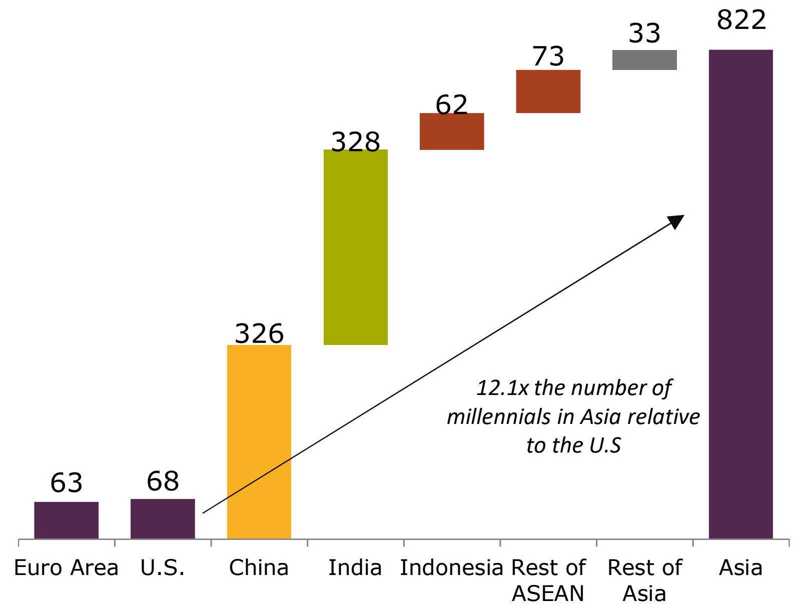
With More than 6x As Many Millennials in Asia than in U.S. and Europe Combined, the Asian Millennial Will Reshape the Global Consumer Market

U.S. Annual Population Growth by Age Group (Thousands)



Data as at September 30, 2020. Source: KKR Global Macro & Asset Allocation, Evercore/ISI, Census Bureau projections.

2020: Number of Working Age Millennials Born 1980-1994, Millions



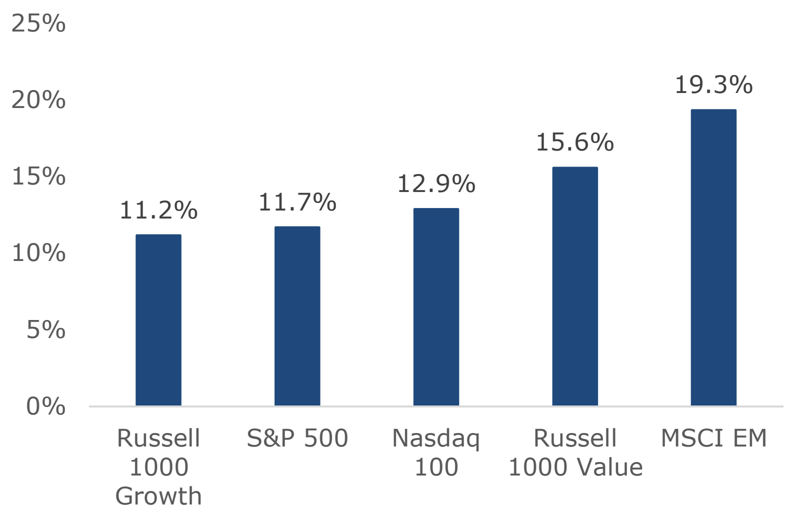
Data as at October 13, 2020. Asia includes China, India, Japan, Hong Kong, Korea, and ASEAN (Indonesia, Malaysia, Philippines, Thailand, Singapore, and Vietnam). Working Age = 15-64. Source: United Nations World Population Prospects, Haver Analytics.

KKR

#3: Dispersions and Dislocations: We Are Likely to Have More Volatility in the Quarters Ahead

We Are Likely Seeing a Structural Rotation in Value Creation Now Occurring Across the Global Capital Markets

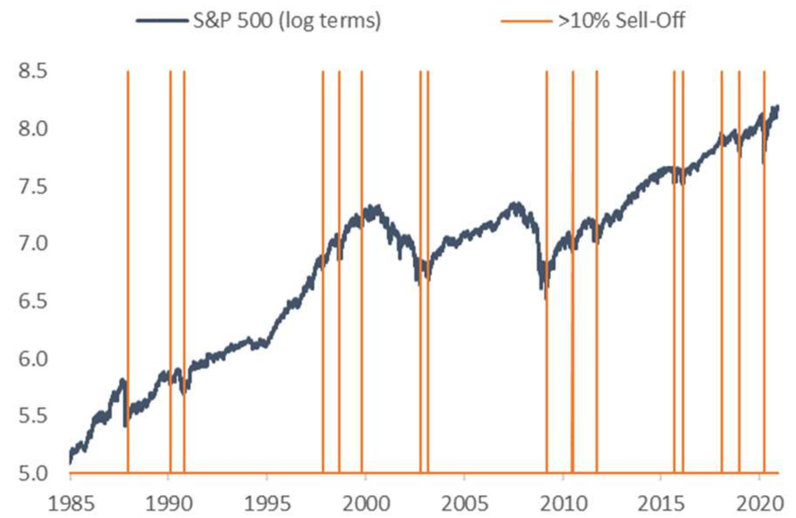
Price Return Since September 30, 2020



Data as at December 31, 2020. Source: Bloomberg.

Five 10% Sell-offs Have Occurred Since 2015. This Compares to Two During the Prior Five Years

Historical S&P 500 Bear Markets

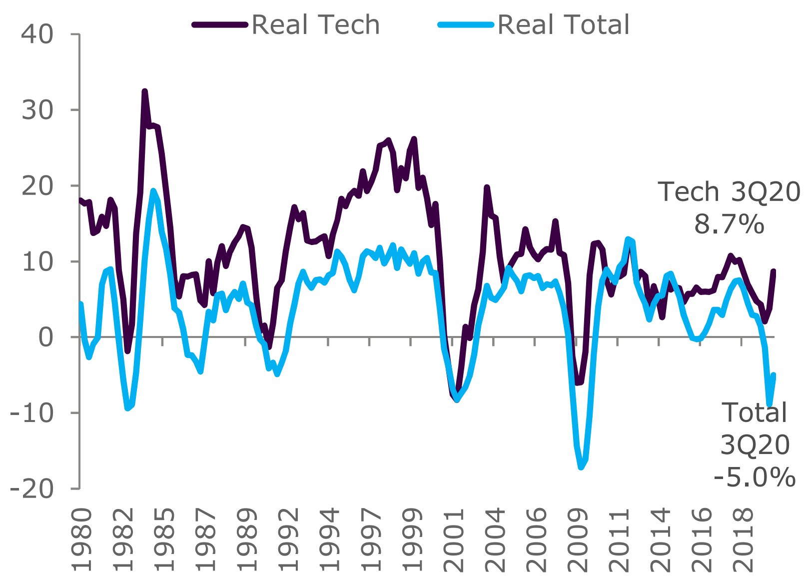


Data as at November 30, 2020. Source: KKR GMAA, Bloomberg.

#4: Intensifying Domestication: Both Demand and Supply Chains Are Poised to Shift

While a Shift Is Occurring in the New Economy, We Also Expect a Sharp Rebound in Non-Tech Spending During the Next 24-36 Months

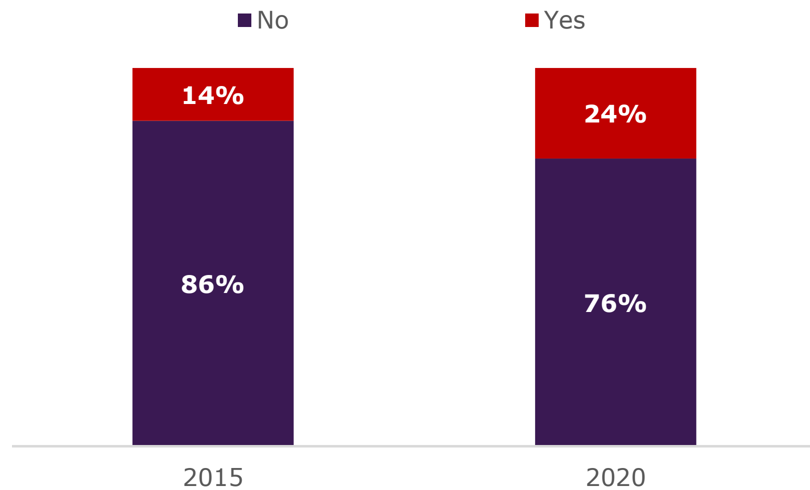
U.S. Real Capex Expenditure, Y/y, %



Data as at September 30, 2020. Source: Cornerstone

Almost 25% of Member Companies Have Reduced or Stopped Planned Investment in China in the Last Year, a Historic High for This Survey

Did Your Company Reduce or Stop Planned Investment in China in the Past Year?

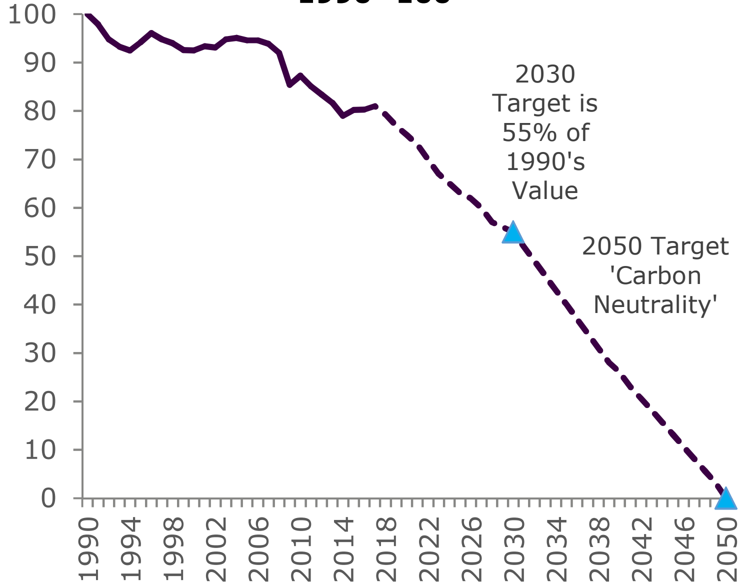


Data as at June 2020. Source: U.S. China Business Council Member Survey.

#5: Fiscal Beneficiaries: We Expect Both Private and Public Sectors to Invest Aggressively Behind Green Initiatives

Significant Funds Have Been Devoted to Climate Action in COVID-Related Stimulus Working Towards Broader 2030 and 2050 Targets

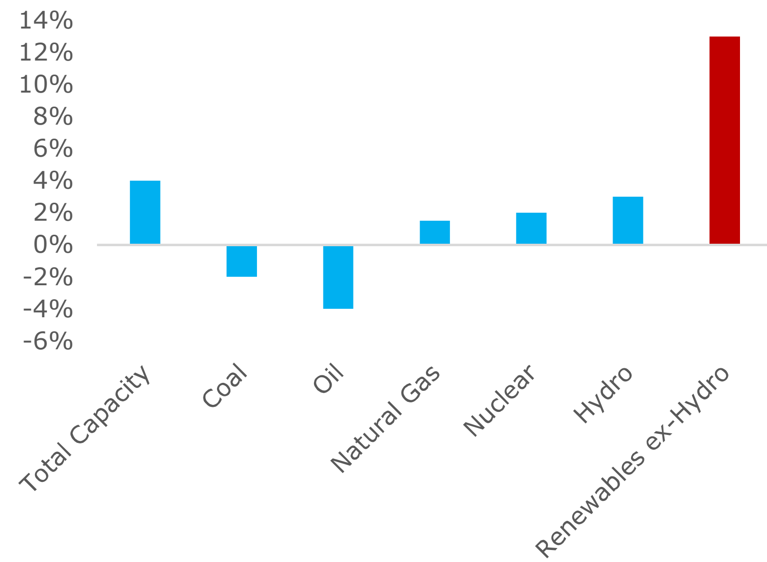
EU Greenhouse Gas Emissions, Net, 1990=100



Data as at July 31, 2020. Source: Eurostat.

Renewables Spending Is Poised to Lead All Energy Spending Initiatives Over the Next Decade

Energy Spending Initiatives CAGR Through 2030, %

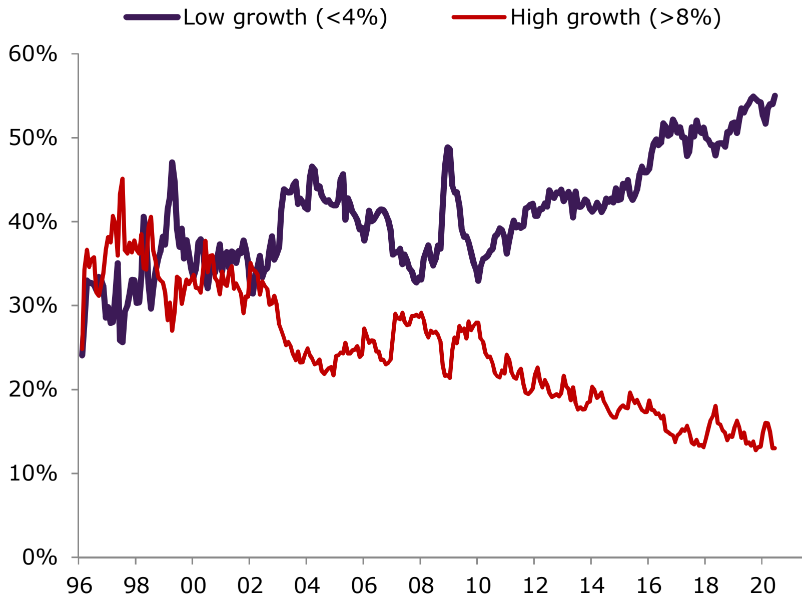


Data as at October 13, 2020. Source: IEA World Energy Outlook 2020.

#6: Secular Compounders: Remain Long Innovation

The Number of Companies That Can Structurally Grow Has Slowed

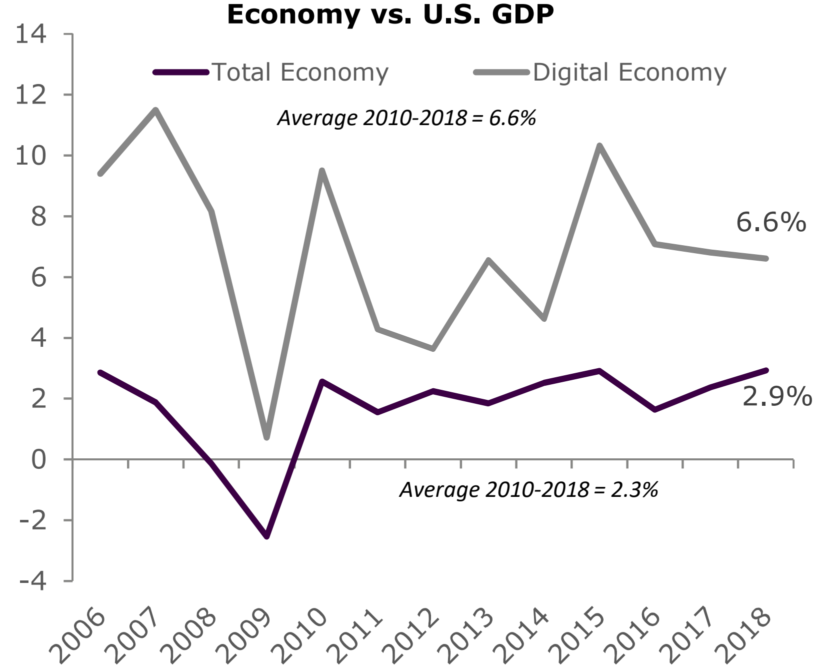
MSCI World Consensus FY3 Sales Growth % of Companies by Growth Bank



Data as at September 30, 2020. Source: Datastream, I/B/E/S, Goldman Sachs Global Investment Research.

Digitalization Has Become a Key Driver of Economic Growth

U.S. Economic Growth, Y/y %, Digital Economy vs. U.S. GDP



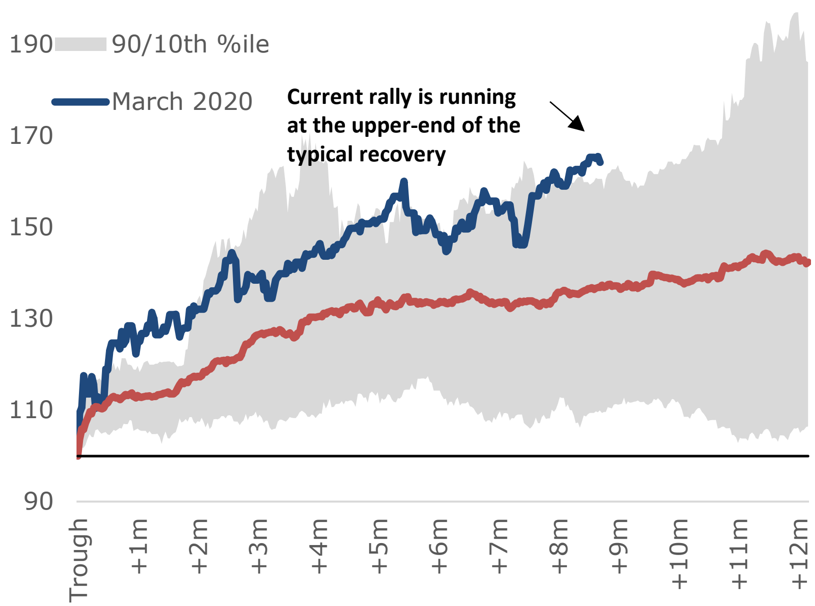
Data as at August 31, 2020. Source: Bureau of Economic Analysis, Cornerstone Macro.

Section V: Valuation and Expected Returns

Equities Have Run Hard, But the Longer-Term Prospects Remain Solid

Relative to Past Cycles, We Are Now Ahead of Schedule in Terms of the Recovery…

S&P 500: Average Recovery Path From +25% Corrections (Indexed to 100 at price trough)



Data as at November 9, 2020. Source: Schiller, Haver Analytics, Bloomberg.

…But Longer-Term Investors Should Just Stay the Course

Historical S&P 500 Recoveries Following >25% Market Crashes

Trough Date	Initial 6-week Recovery	Return Following Initial 6-Week Recovery: +3m	+6m	+12m	+3yr	+3yr Annualized
Nov-29	18.0%	18.1%	(7.0%)	(28.7%)	(68.5%)	(31.9%)
Jun-32	8.9%	43.6%	53.2%	147.4%	121.7%	30.4%
Feb-33	17.7%	82.2%	54.4%	69.3%	136.4%	33.2%
Oct-33	15.1%	8.2%	(1.2%)	(3.7%)	74.4%	20.4%
Mar-35	16.6%	14.1%	31.2%	53.6%	8.6%	2.8%
Mar-38	20.7%	18.6%	34.4%	9.3%	(6.8%)	(2.3%)
Jun-40	11.0%	6.7%	5.4%	4.4%	25.4%	7.8%
Apr-42	11.6%	4.1%	11.5%	45.6%	79.0%	21.4%
Oct-46	0.6%	10.4%	(2.7%)	7.9%	13.6%	4.3%
Jun-62	9.9%	1.5%	15.1%	21.8%	49.7%	14.4%
May-70	5.4%	19.0%	24.9%	37.5%	38.7%	11.5%
Oct-74	15.5%	12.7%	28.3%	26.5%	32.6%	9.8%
Aug-82	20.4%	13.3%	23.9%	37.5%	49.4%	14.3%
Oct-87	3.2%	15.4%	9.2%	18.0%	38.9%	11.6%
Jul-02	12.0%	3.1%	(6.6%)	15.1%	36.3%	10.9%
Nov-08	23.8%	(10.5%)	(0.9%)	19.7%	35.0%	10.5%
Mar-20	*28.2%*	*14.9%*				
Geometric Mean	**13.0%**	**14.8%**	**15.6%**	**25.4%**	**31.3%**	**9.5%**
Median	**13.5%**	**13.0%**	**13.3%**	**20.7%**	**37.5%**	**11.2%**
Simple Average	***13.2%***	***16.3%***	***17.1%***	***30.0%***	***41.5%***	***10.6%***

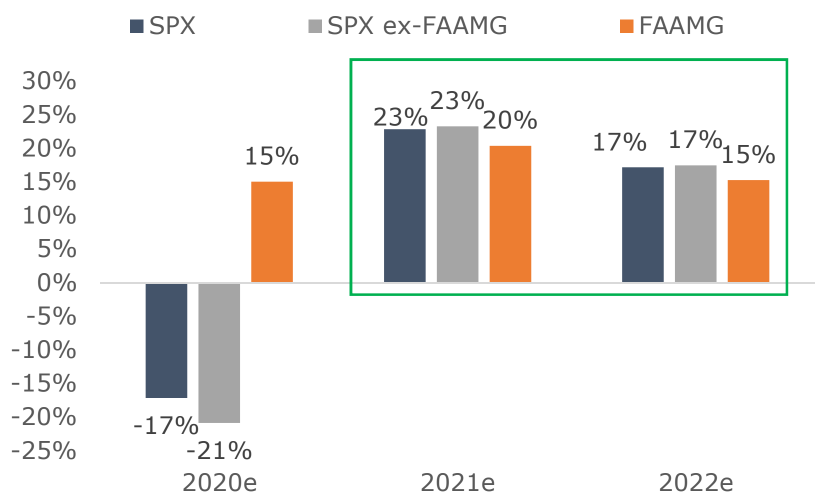
Data as at August 31, 2020. Source: Bloomberg.

KKR

Underpinning Our Positive Outlook Is That the Market Will No Longer Be As Dependent On the FAAMG Stocks for Success

Consensus Expects S&P 500 ex-FAAMG EPS to Grow Faster Than FAAMG Stocks Themselves in 2021-22

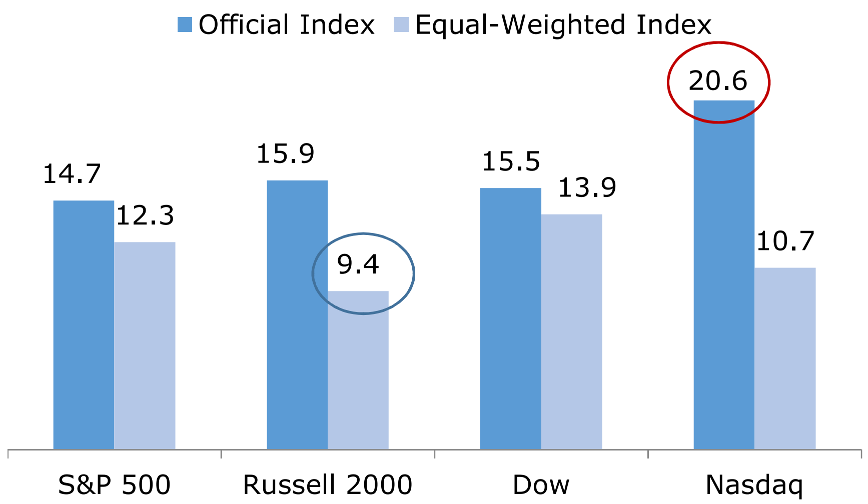
S&P 500 EPS Growth Estimates



Data as at November 30, 2020. Source: S&P 500, KKR Global Macro & Asset Allocation analysis.

Secular Stagnation Concerns Which Are Also Reflected in the Valuations of Secular Growth vs. Economically Sensitive Equities

Current NTM EV/EBITDA: U.S. Equity Indexes

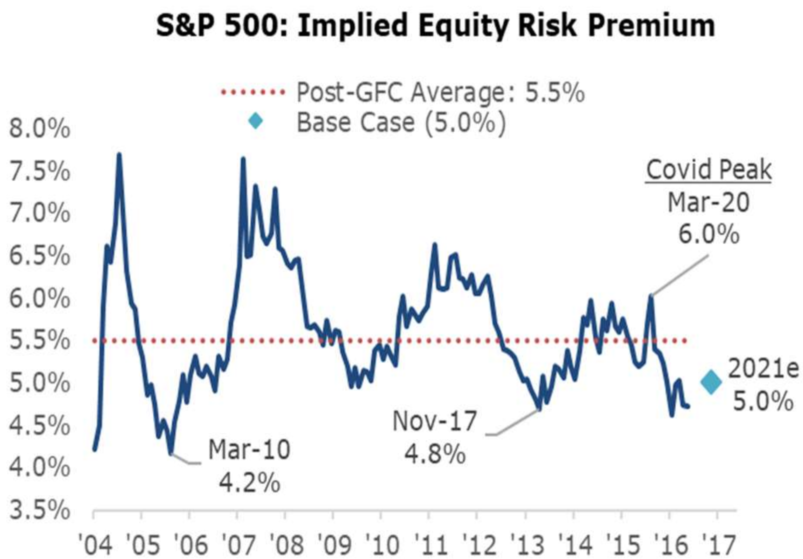


Data as at October 14, 2020. Source: KKR Global Macro & Asset Allocation analysis, S&P 500, Bloomberg, Factset..

KKR

We Still See More Upside to Markets in 2021

Given All the Fed Is Doing, We Expect the Equity Risk Premium (ERP) to Be Slightly Below Its Post GFC Average



Data as at December 31, 2020. Source: Haver Analytics, S&P, Factset, KKR Global Macro & Asset Allocation analysis leveraging Professor Aswath Damodaran's work on implied equity risk premium.

Our New Fair Value Estimate for the S&P 500 Is 4050 in 2021e

Implied Equity Risk Premium, %

10-Yr U.S. Treasury Yield, %	5.75%	5.50%	5.25%	5.00%	4.75%	4.50%	4.25%
2.00%	3,226	3,382	3,553	3,742	3,953	4,188	4,452
1.75%	3,312	3,473	3,649	3,844	4,060	4,302	4,575
1.50%	3,400	3,565	3,746	3,947	4,170	4,419	4,699
1.25%	3,489	3,658	3,845	4,051	4,281	4,537	4,825
1.00%	3,579	3,754	3,945	4,158	4,393	4,657	4,953
0.75%	3,671	3,850	4,048	4,266	4,508	4,779	5,084
0.50%	3,764	3,948	4,151	4,375	4,624	4,903	5,216

Data as at November 18, 2020. Source: S&P 500, KKR Global Macro & Asset Allocation analysis.

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We Continue to Suggest Selective Engagement With Emerging Markets

One Of Our More Influential Macro Models Is Suggesting That Emerging Market Equities Should Outperform Developed Market Equities As Valuation Has Moved Into the Green Zone

	"Rule of the Road"	May'15	Jan'16	Aug'16	May'17	Sep'17	Jun'18	Dec'18	Dec'19	Sep'20
1	Buy When ROE Is Stable or Rising	↔	↔	↔	↗	↗	↗	↗	↔	↔
2	Valuation: It's Not Different This Time	↔	↗	↗	↗	↔	↔	↔	↔	↗
3	EM FX Follows EM Equities	↘	↘	↔	↔	↗	↔	↗	↗	↗
4	Commodities Correlation in EM is High	↔	↔	↔	↔	↔	↗	↔	↔	↔
5	Momentum Matters in EM Equities	↘	↘	↗	↔	↗	↔	↘	↔	↔

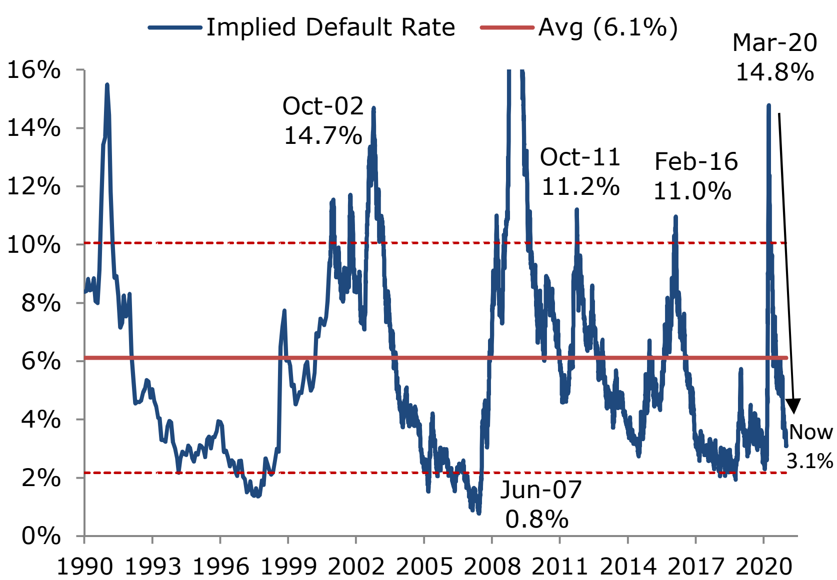
Overall For long-term investors, we continue to recommend selective engagement with Emerging Markets. Across several measures, EM equity valuations are at the most attractive levels relative to DM since the early 2000s. EM currencies also look washed out, and may benefit over time from the U.S. Fed's reflation efforts, which we believe are USD-negative. All that said, fundamentals in many instances do not yet look compelling. Across most EMs, post-pandemic fiscal stimulus has been underwhelming relative to DMs. Ongoing global trade tensions are a further headwind for some EMs.

Data as at November 30, 2020. Source: KKR Global Macro & Asset Allocation analysis.

Credit Appears to Be Closer to Fair Value. Sectoral Bifurcations Remain Substantial

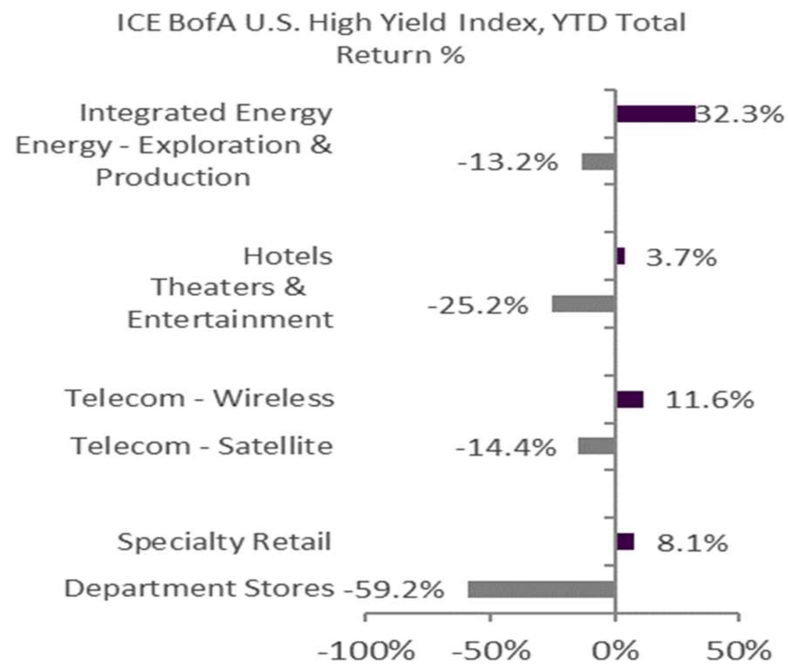
Markets Are Now Discounting That Default Rates Are Back Near to the Historical Norm

U.S. High Yield Implied Default Rate, %



Data as at December 31,2020. Source: Bloomberg.

There Are Lots of Things Skewing the Market Once You Peel Back the Layers

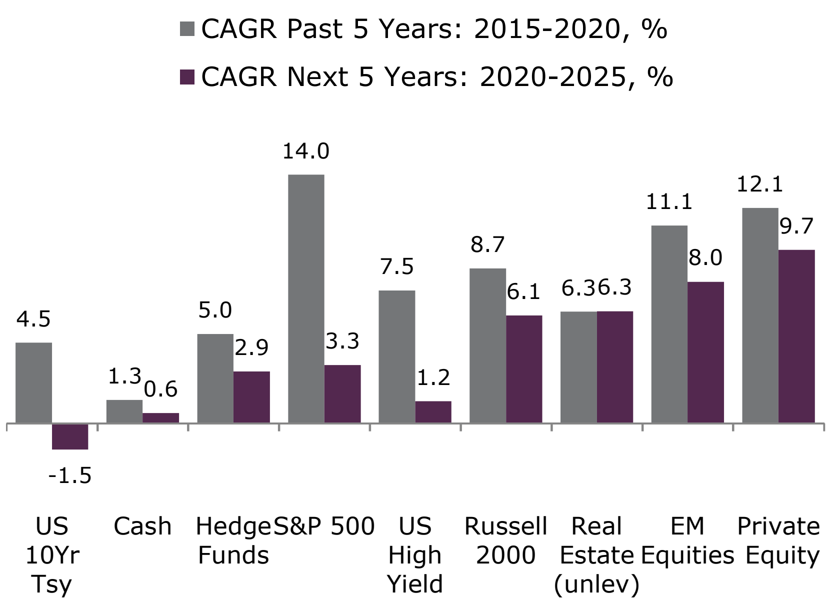


Data as at November 30, 2020. Source: Bloomberg.

A Lower Return Profile for Most Asset Classes on a Go-Forward Basis Will Likely Encourage More, Not Less, Risk Taking

We Generally Look for Lower Returns Across Many of the Asset Classes We Forecast

Expected Returns by Asset Class, %



Data as at November 20, 2020. Source: Bloomberg, Haver Analytics, Cambridge Associates, KKR Global Macro & Asset Allocation analysis.

Generating Returns Using Just Stocks and Bonds Will Be Much More Challenging in the Future

	5 Year Outlook			
Return Assumptions	**Base Case**	**Low Growth**	**High Growth**	**Past 5 Yrs**
Stocks	3.3%	-0.8%	8.0%	14.0%
Bonds	-1.5%	-0.5%	-3.4%	4.5%

Allocation		Expected Returns			Past
Stocks	**Bond**	**Base**	**Bear**	**Bull**	**5 Yrs**
0%	100%	-1.5%	-0.5%	-3.4%	4.5%
10%	90%	-1.0%	-0.5%	-2.3%	5.5%
20%	80%	-0.5%	-0.6%	-1.1%	6.4%
30%	70%	-0.1%	-0.6%	0.0%	7.4%
40%	*60%*	*0.4%*	*-0.6%*	*1.2%*	*8.3%*
50%	50%	0.9%	-0.6%	2.3%	9.3%
60%	**40%**	**1.4%**	**-0.7%**	**3.4%**	**10.2%**
70%	30%	1.8%	-0.7%	4.6%	11.1%
80%	20%	2.3%	-0.7%	5.7%	12.1%
90%	10%	2.8%	-0.7%	6.9%	13.0%
100%	0%	3.3%	-0.8%	8.0%	14.0%

High growth case is when inflation and interest rates rise. Low Growth case is when there is deflation risk and rates fall further or we do QE. Data as at November 20, 2020. Source: Bloomberg, Haver Analytics, Cambridge Associates, KKR Global Macro & Asset Allocation analysis.

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Section VI: Risks

#1: Under Almost Any Traditional Metric, Equities Appear Fully Valued. However, Interest Rates Do Matter

The Market Looks Expensive on All Metrics Except Interest Rate Adjusted Metrics. Importantly, Though, Interest Rates Do Matter

	S&P 500 Aggregate Index	
Valuation Metric	**Current**	**Historical Percentile**
U.S. Market Cap/GDP	239%	**100%**
EV/Sales	3.0x	**100%**
EV/EBITDA	15.9x	**100%**
Forward P/E	22.3x	**96%**
Cash Flow Yield	6.1%	**93%**
Price/Book	3.9x	**92%**
Cyclically Adjusted P/E	29.0x	**91%**
Free Cash Flow Yield	3.8%	**60%**
Yield Gap vs. 10-Year UST	367 Basis Points	**37%**
Median Metric		**92%**

S&P 500 data from 1976 apart from FCF yield which is from 1990. Credit market data from 1997, equity risk premium from 2001 and government bond data from 1921. Data as at November 9, 2020. Source: Goldman Sachs.

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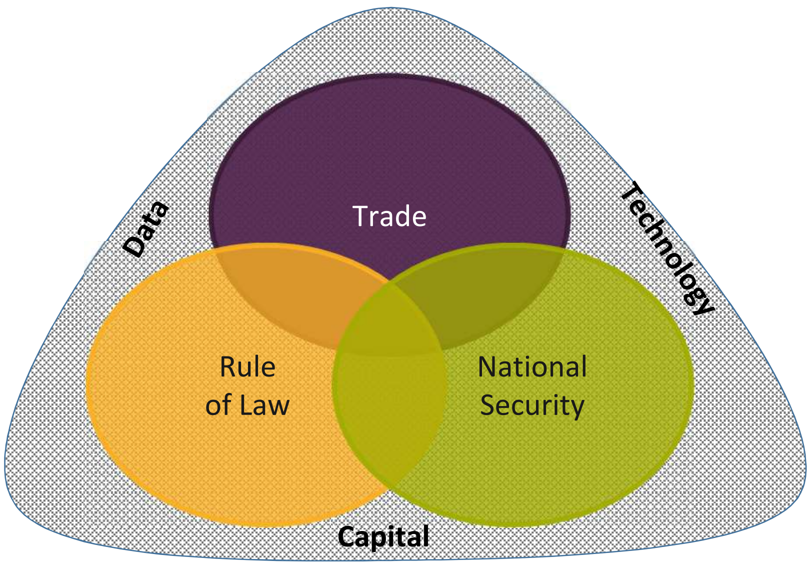
#2: The U.S. China Relationship Is Changing

National Security Is Now Bundled With Rule of Law and Trade Negotiations, and Wrapped in the Complexity of Digitization

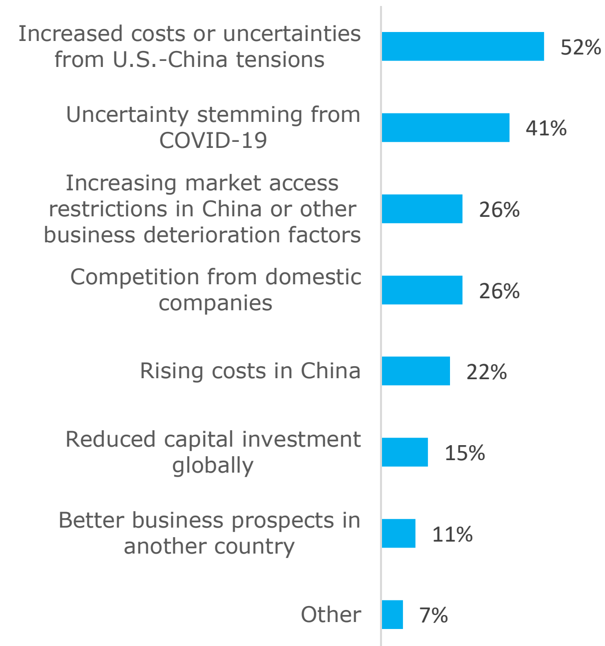
Blurring of Lines Across Trade, Rule of Law, and National Security



Data as at November 30, 2020. Source: KKR Global Macro & Asset Allocation analysis.

The Top Reasons for Curtailing Investment in China Are Increased Costs or Uncertainties from U.S.-China Tensions and COVID-19

2020 USCBC Survey: Why Did Your Company Reduce or Stop Planned Investment in China in the Last Year?



Data as at June 2020. Source: US China Business Council Member Survey.

Section VII: Conclusions

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Key Conclusions

Overall Observations

- Our Square Root Recovery Will Translate into Stronger Growth by 2022
- Global Savings Will Encourage the Consumer to Spend
- Rates Have Bottomed, While Inflation Will Be a Lagging Indicator
- Stay Invested, But We Are at an Inflection Point for ‘Traditional’ Asset Allocation

Top-Down Themes

- Collateral-based Cash Flows
- Rise of the Global Millennial
- Embrace Dislocation and Dispersion
- Secular Winners/Innovation
- Fiscal Beneficiaries, Including ESG
- Intensifying Domestication

CIEBA January Virtual Working Group Meeting

What Considerations Does A Lower Rate Environment Mean For Both DB Plans & Their Sponsors?

Insight INVESTMENT

January 2021

BNY MELLON | INVESTMENT MANAGEMENT

Today’s Topics

- Rationale for LDI today?
- Corporate Risk Appetite and Capacity Post-COVID
- Balancing Stakeholder Needs / Setting Objectives
- Impact of Potential Pension Funding Relief?
- Closing Remarks

Session Participants

CIEBA Member Panelists

Ernie Caballero
Chief Investment Officer, UPS

Laurence Fulton
Chief Investment Officer, Verizon

Liza Scott
Director of Asset Management,
Dominion Energy

Insight Investment Panelists

Abdallah Nauphal
Chief Executive Officer

Kevin McLaughlin
Head of Liability Risk Management -
North America

Introduction to Insight Investment

An Alternative Investment Approach

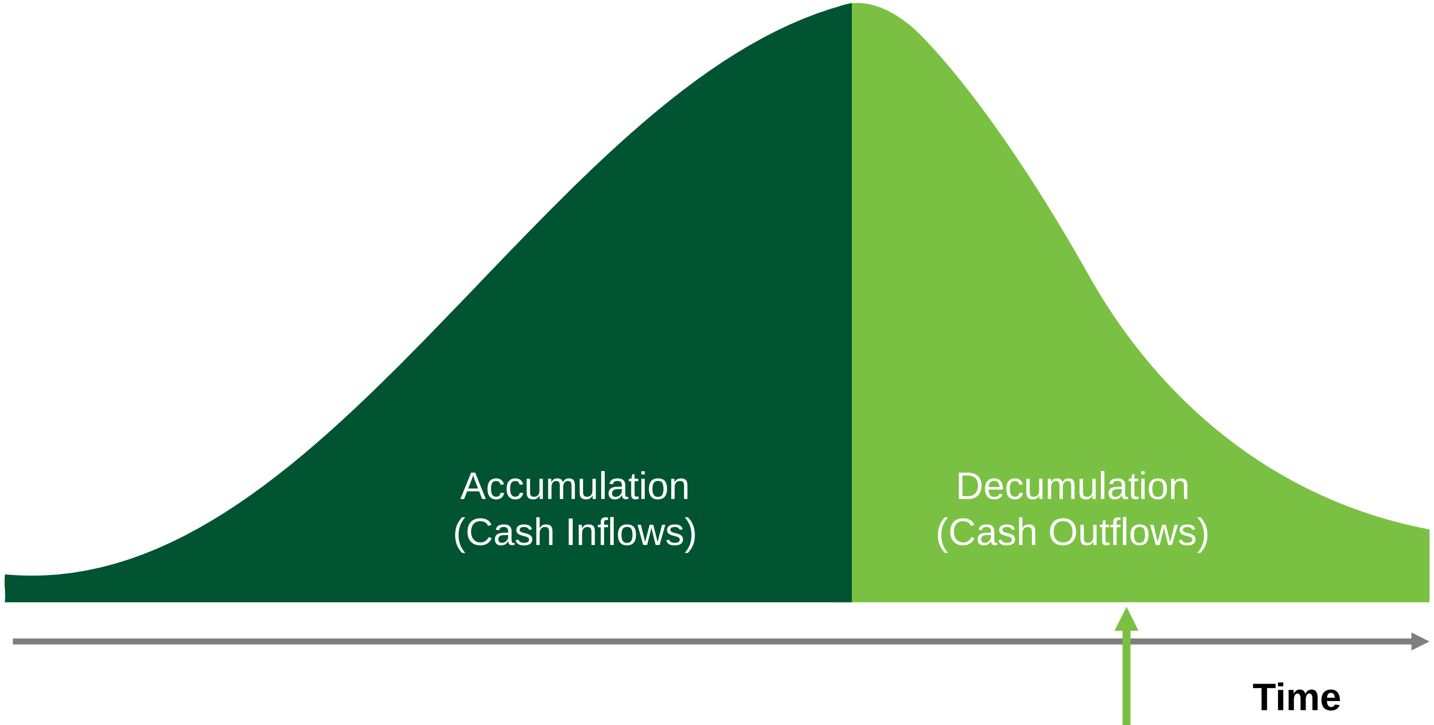
Asset focus

Maximize Return

Minimize Volatility

Outcome focus

Maximize Certainty of Outcome



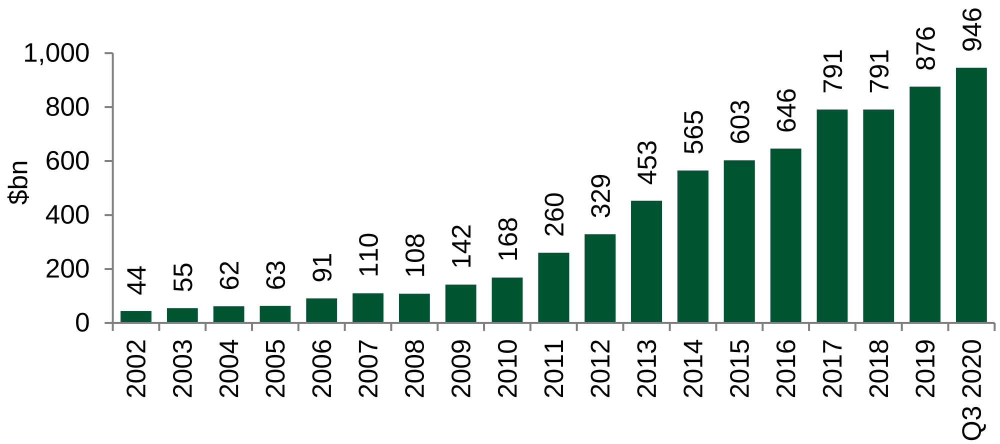
For illustrative purposes only. Does not represent any strategy, composite, or client account managed by Insight.

Overview of Insight Investment

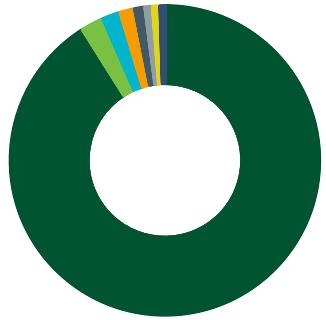
Specialist manager of risk solutions and active fixed income:

- over $940bn in assets under management[1]
- 235 investment professionals, 950 total staff[2]
- 45 investment professionals and 121 staff in the US[2]
- offices in London, New York, Dublin, Frankfurt, Manchester, Sydney and Tokyo

Assets under management[1]

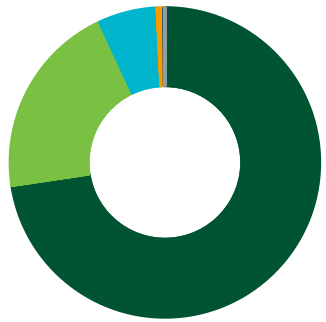


By client type



- Pension $861.2bn
- Insurance $22.6bn
- Financial institutions $17.9bn
- Local authority/government $14.5bn
- Sovereign wealth $10.1bn
- Corporate $7.4bn
- Intermediary $7.4bn
- NFP: endowments/charities $4.6bn

By investment solution



- Risk management solutions $687.0bn
- Fixed income $193.5bn
- Currency management $57.8bn
- Multi-asset $6.7bn
- Specialist equity $0.6bn
- Other[3] $0.2bn

As of September 30, 2020. [1] Insight's assets under management (AUM) are represented by the value of cash securities and other economic exposures and are calculated on a gross notional basis. Insight North America (INA) is part of 'Insight' or 'Insight Investment', the corporate brand for certain asset management companies operated by Insight Investment Management Limited including, among others, Insight Investment Management (Global) Limited, Insight Investment International Limited and Insight Investment Management (Europe) Limited. Advisory services referenced herein are available in the US only through INA. Figures shown in USD. FX rates as per WM Reuters 4pm spot rates. Excludes previous parent introduced assets prior to 2009. [2] Includes employees of Insight North America LLC (INA) and its affiliates, which provide asset management services as part of Insight, the corporate brand for certain companies operated by Insight Investment Management Limited (IIML). [3] Other includes real assets.

Rationale for LDI today?

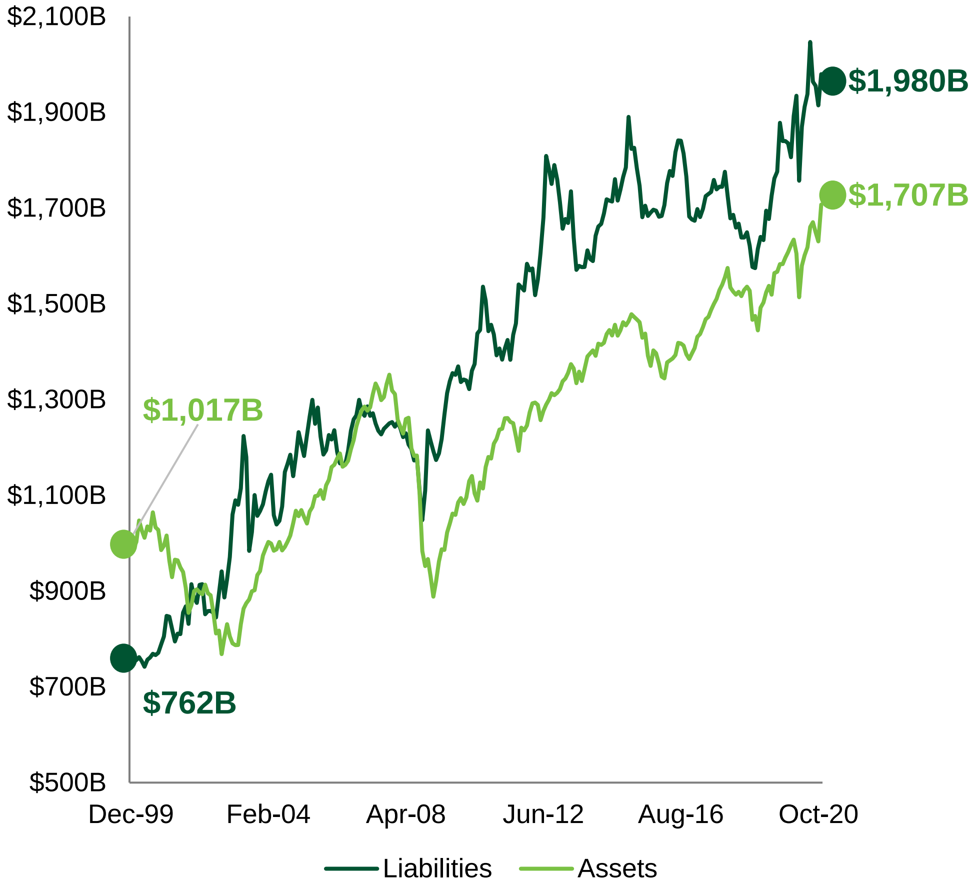
Polling Question 1

What Is The Biggest Risk To Your Pension Plans Meeting Their Long-Term Obligations?

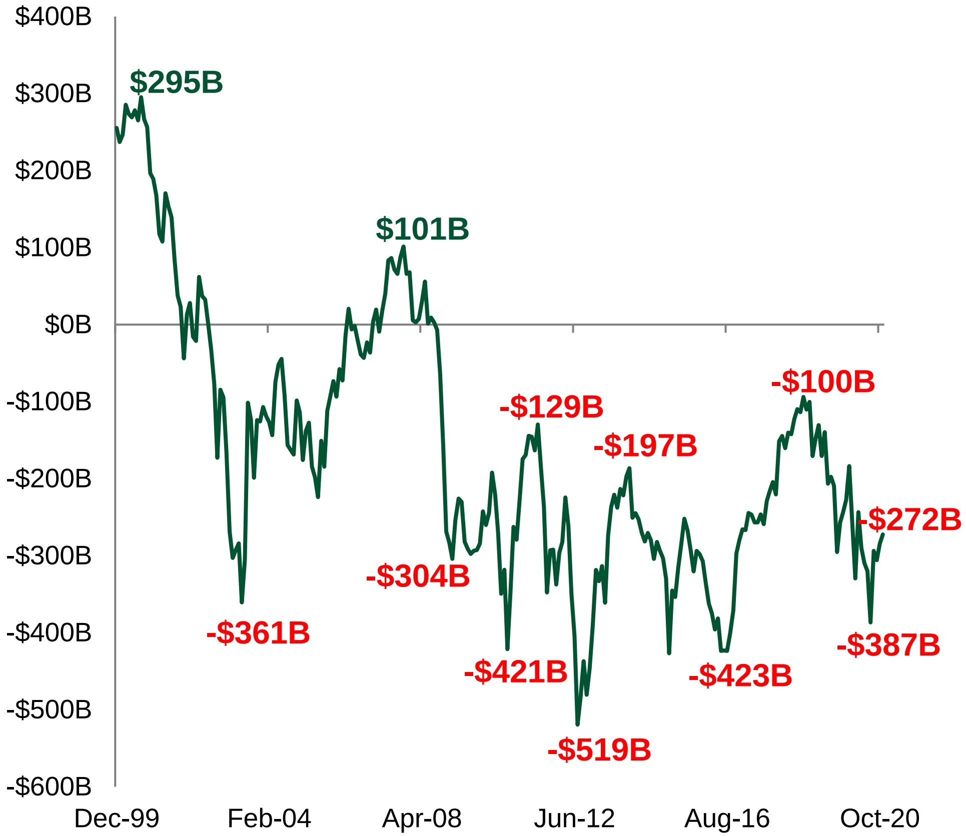
A	Equity Risk / Valuations
B	Risk Of Lower Discount Rates
C	Managing Liquidity
D	Financial Stress On The Company
E	Other

Material Increase in Liabilities Exceeds Asset Growth, Rising Deficits

Material Increase in Liabilities, Exceeding Asset Growth



Difference in Assets vs. Liabilities



As of November 30, 2020. Source: Milliman 100 Pension Funding Index, Insight calculations. Information contained herein is derived from sources believed to be reliable. Insight does not guarantee or warrant the accuracy, timeliness, or completeness of the information either collected, sourced or otherwise provided, and is not responsible for any errors or omissions.

Although Funded Status Volatility has Declined Meaningfully… Dollar Risk and Discount Rate Sensitivity have Risen as Rates have Fallen...

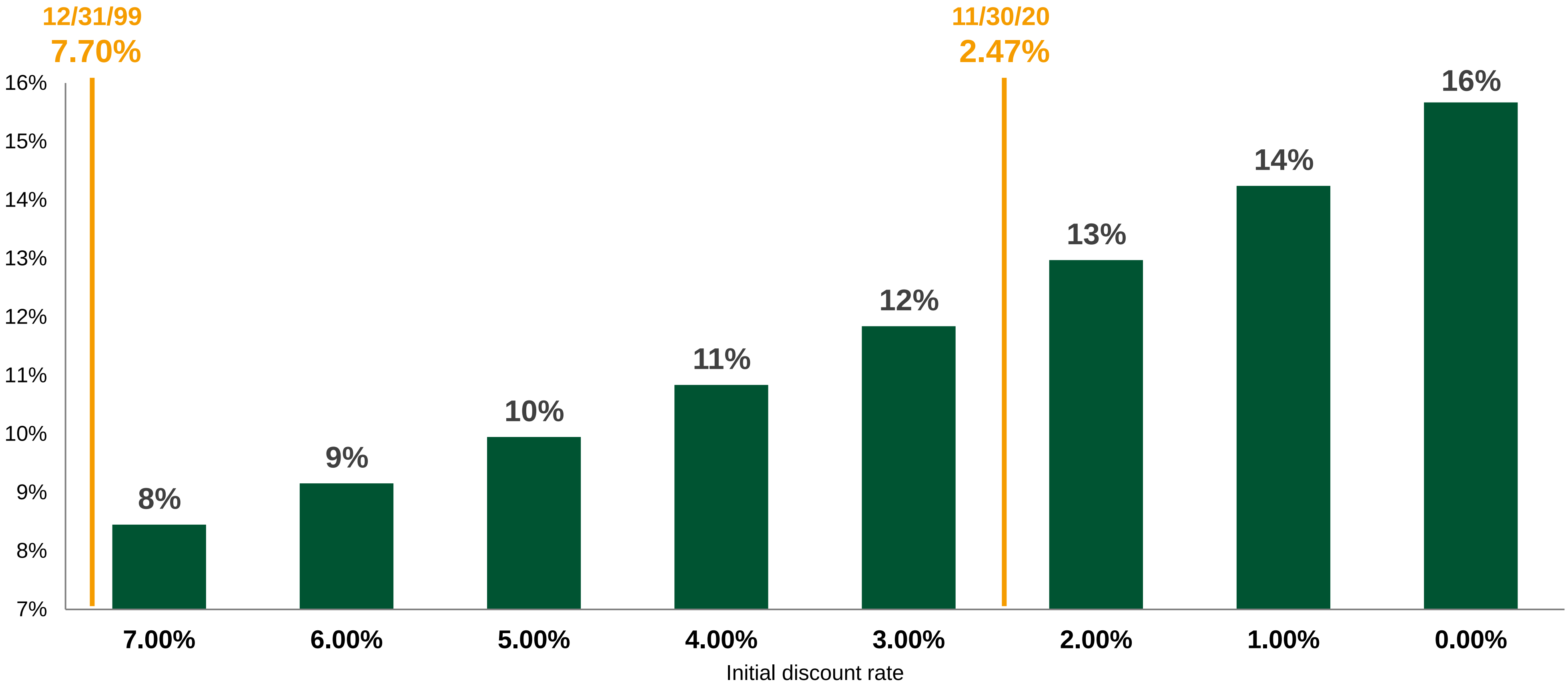
Insight INVESTMENT

	FYE04	FYE09	FYE12	FYE16	Nov ‘20
PBO ($B)	**$1,180B**	**$1,340B**	**$1,710B**	**$1,680B**	**$1,980B**
Funded Status	**90%**	**82%**	**77%**	**83%**	**86%**
Funded Status Volatility	**13%**	**11%**	**9%**	**9%**	**8%**
Funded Status Risk ($B)	**$153B**	**$146B**	**$159B**	**$143B**	**$158B**
Sensitivity to 1% Discount Rate Change ($B)	**$115B**	**$127B**	**$185B**	**$186B**	**$247B**

Source: Bloomberg, Historical Milliman 100 Pension Funding Index Results, Insight calculations. Assumes a fixed cashflow profile equating to a $1.81T PBO with 12 year duration as of 12/31/2019. Asset allocation assumptions: 2004/2009: 40% Equity/20% Alts/40% Fixed Income (20% Hedge Ratio), 2012: 40% Equity/20% Alts/40% Fixed Income (30% Hedge Ratio), 2016: 37% Equity/18% Alts/45% Fixed Income (40% Hedge Ratio) 2020: 33% Equity/17% Alts/50% Fixed Income (50% Hedge Ratio). Funded Status risk represents a 1 standard deviation change in Funded Status over a one-year period. Model calibrated with returns 15-year data for the period ending 12/31/2019. Information contained herein is derived from sources believed to be reliable. Insight does not guarantee or warrant the accuracy, timeliness, or completeness of the information either collected, sourced or otherwise provided, and is not responsible for any errors or omissions.

Required Return on Growth Assets Becomes Large To Offset Falls in Discount Rates – Sensitivity Increases as Rates Fall

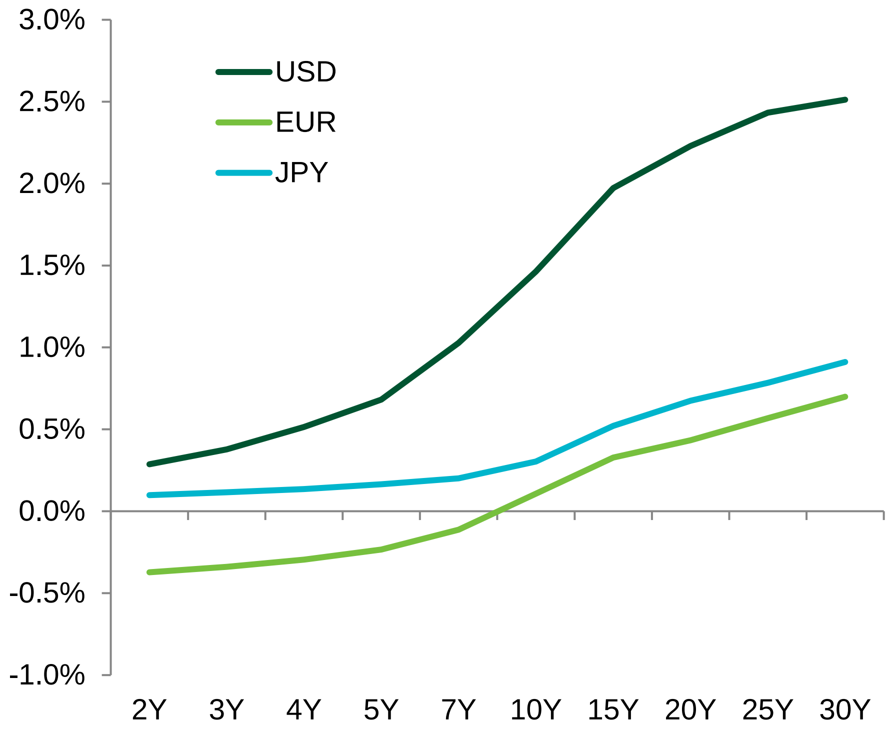
Required Growth Portfolio Return to Preserve Funded Status for a 1% Instantaneous Discount Rate Decline
Assumes the plan is 50% hedged



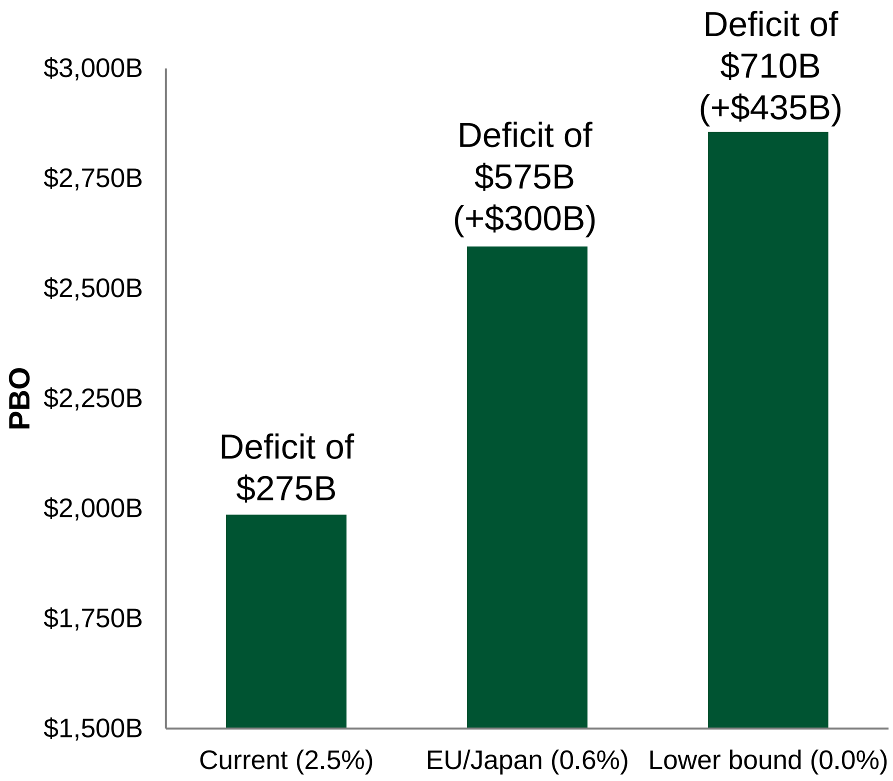
For illustrative purposes only. December 31, 1999 and November 30, 2020 discount rates sourced from Milliman. Insight key assumptions: ~13 year duration at 2.5% discount rate, 86.2% funded, 50% growth:50% fixed income allocation, 50% hedge ratio. Where model or simulated results are presented, they have many inherent limitations. Model information does not represent actual trading and may not reflect the impact that material economic and market factors might have had on Insight's decision-making.

Can Discount Rates Fall to Levels Experienced in EU & Japan?

AA Corporate Yield Curves as of November 30, 2020[1]



Liabilities Increase >30% in a Europe/Japan scenario[2]



[1] Source: Bloomberg [2] Source: Milliman 100 Pension Funding Index, Insight calculations. Assuming 12 year duration plan, 80% funded, 50% hedge ratio. Information contained herein is derived from sources believed to be reliable. Insight does not guarantee or warrant the accuracy, timeliness, or completeness of the information either collected, sourced or otherwise provided, and is not responsible for any errors or omissions.

Corporate Risk Appetite and Capacity Post-COVID

Polling Question 2

Does Your Plan Utilize An Interest Rate Hedge Path? How are Triggers Set?

- **A** Triggers are Based on **Funded Status** Only
- **B** Triggers are Based On **The Level Of Rates** Only
- **C** Hedging is Increased **Systematically with Time** Only
- **D** Hedging is Based on a **Combination of Triggers**
- **E** We Do Not Utilize A Hedge Path

Verizon's Situation

verizon✓

DB Assets	$19.5B
GAAP PBO	$21.2B
Funded Status	91%
LDI %	45%
Hedge Ratio %	51%
Market Cap (12/31/19)	$254B
Net Debt	$109B

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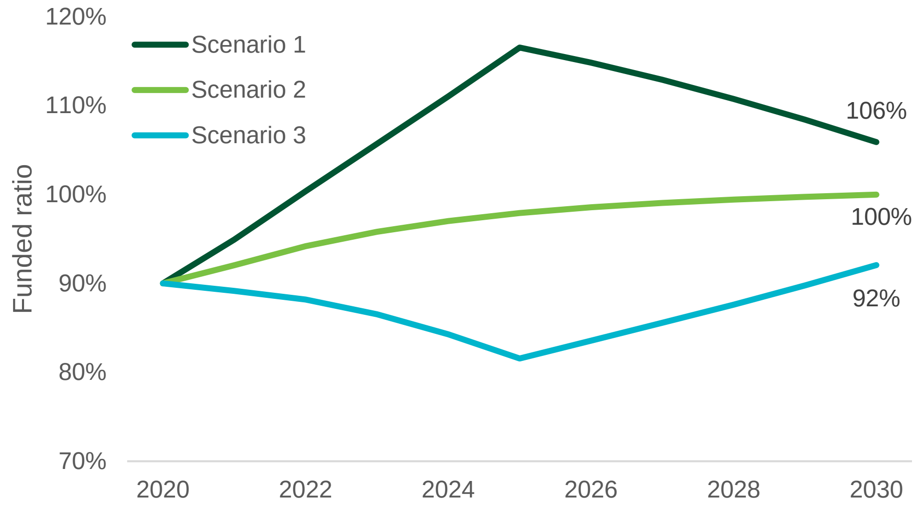
Keeping Your Problem 'Solvable'

Stabilizing the Required Return

Total Return Required to Achieve 100% Funded Status Over 10 years

Interest Rate Shock[1]	Hedge Ratio 30%	Hedge Ratio 60%	Hedge Ratio 90%
-200bp	5.3%	4.1%	3.1%
-100bp	4.2%	3.7%	3.1%
0bp	3.1%	3.1%	3.1%
100bp	2.0%	2.6%	3.1%
200bp	0.9%	2.0%	3.1%

Sensitivity to Timing of Returns



Portfolio Return

Scenario	Years 1-5	Years 6-10	Average
1	7.2%	0.0%	**3.1%**
2	3.1%	3.1%	**3.1%**
3	0.0%	6.2%	**3.1%**

Source: Public information, Bloomberg, Insight. Discount rate shocks are applied on November 30, 2020 and follow the forward curve thereafter. Key assumptions: ~13 year duration at 2.5% discount rate, 90% funded. Assumes contributions equal to future service cost, other no other PPA Minimum Required Contributions. Ratings and cash flow profiles are estimated and subject to change without notice. Information contained herein is derived from sources believed to be reliable. Manager makes no assurances that projected returns will be achieved. See appendix for additional disclosure about performance. Insight does not guarantee or warrant the accuracy, timeliness, or completeness of the information either collected, sourced or otherwise provided, and is not responsible for any errors or omissions. Where model or simulated results are presented, they have many inherent limitations. Model information does not represent actual trading and may not reflect the impact that material economic and market factors might have had on Insight's decision-making. Insight does not guarantee the projections being presented. In fact, projections could be materially different than what is shown herein.

Plan Sponsor and Pension Situation Post-COVID

Corporate Situation

Revenue and Profitability	
Corporate Liquidity Needs	
Corporate Leverage and Ratings	
Visibility into the Future	

Corporate Pension Situation

Risk Appetite for Pension	
Pressure on GAAP Earnings from Pension Credit	
Board Level View on Trade-Off	

For illustrative purposes only.

Does Pension Size Matter?

Scenario 1
Plans are Well Financed and Risk Managed

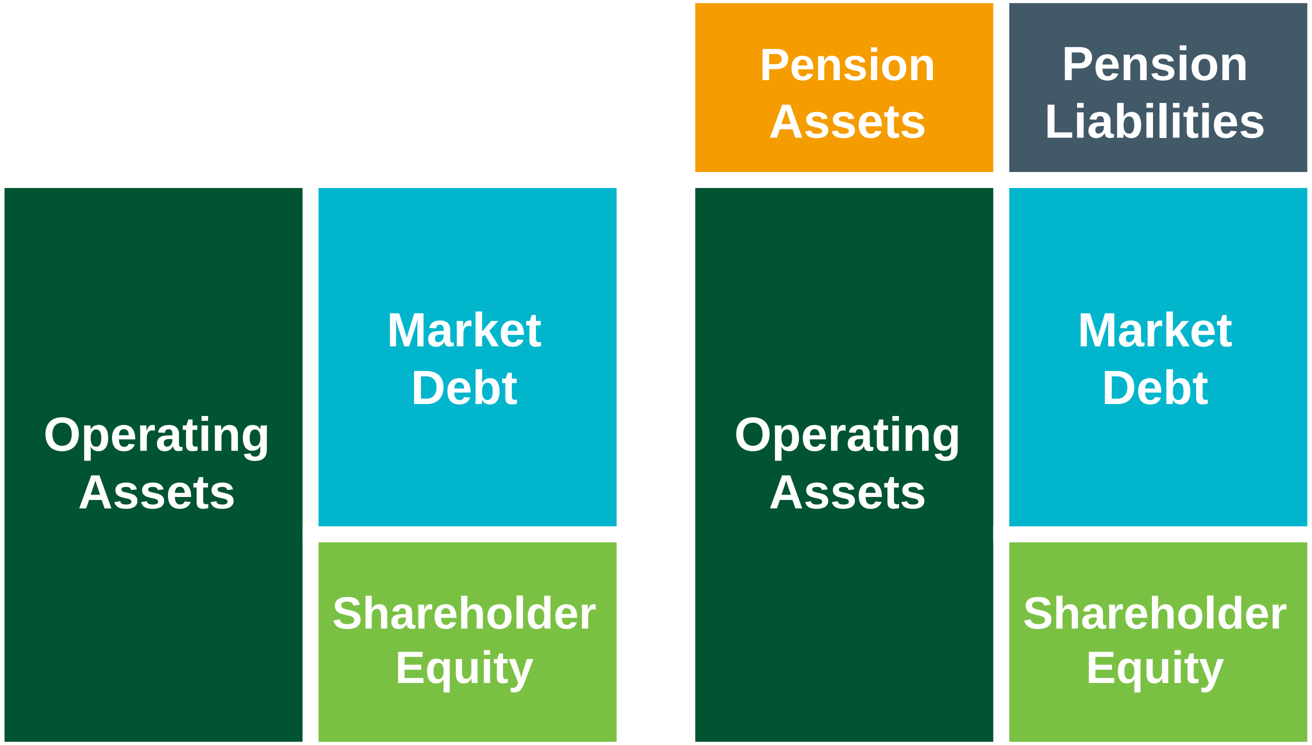
Scenario 2
Pension Plan is Large, Underfunded and Volatile

For illustrative purposes only.

Core Business vs. Enterprise Risk Management?

Company A
- Without Pension Risk

Company B
- With Pension Risk



Optimal Corporate Finance Policy

- <u>Maximize</u> funding
- <u>Minimize</u> volatility of A to L

For illustrative purposes only. Opinions expressed herein are subject to change without notice. Insight assumes no responsibility to update such information or to notify a client of any changes.

Balancing Stakeholder Needs / Setting Objectives

Polling Question 3

The Primary Driver Of The ERoA Assumption Is:

- **A** Historic Levels of Return
- **B** Capital Markets Projections
- **C** Combination of Historic Level and Capital Markets Projections
- **D** Other

Dominion Energy's Situation

Dominion Energy®

DB Assets	$10.4B
GAAP PBO	$9.6B
Funded Status	92%
LDI %	35%
Hedge Ratio %	30%
Market Cap (12/31/19)	$69B
Long-Term Debt	$34B

Balancing the Needs of Different Stakeholders: Utility Case

Rate Payer Objectives

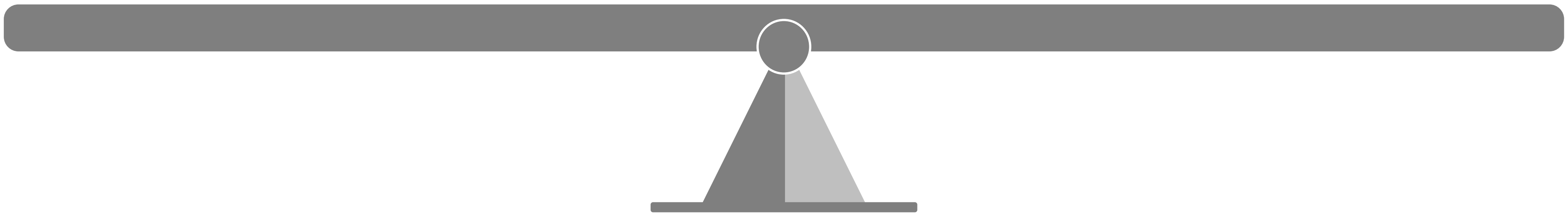
- Reduce the Economic Cost of Benefit Delivery
- Mitigate Risk of Large Cost Increases

Corporate Objectives

- Stabilize Pension Expense, Contributions, Balance Sheet
- Shrink Pension Deficit Over Time

Fiduciary Objectives

- Generate Attractive Risk-Adjusted Returns
- Balance the Liquidity Requirements of the Plans' Liabilities
- Minimize the Risk of Significant Losses



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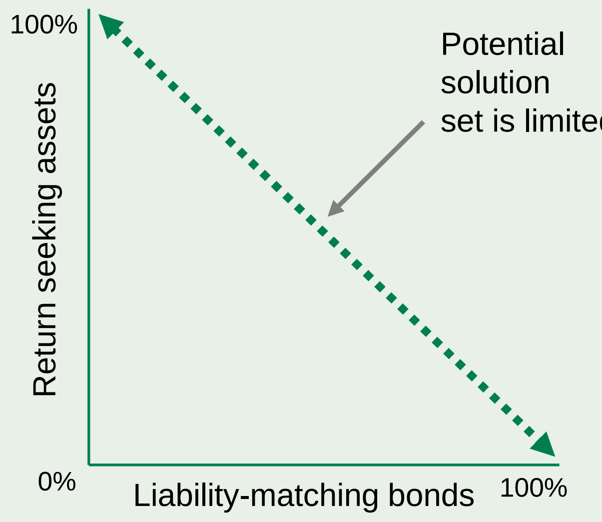
Risk Overlay Can Help Avoid the Asset-Liability Trade-Off

Potential Benefits of Incorporating Overlay

- Separate the Decision to Generate Asset Returns and Managing Liability Risk
- Achieve a More Deliberate and Precise Management of Risk and Return

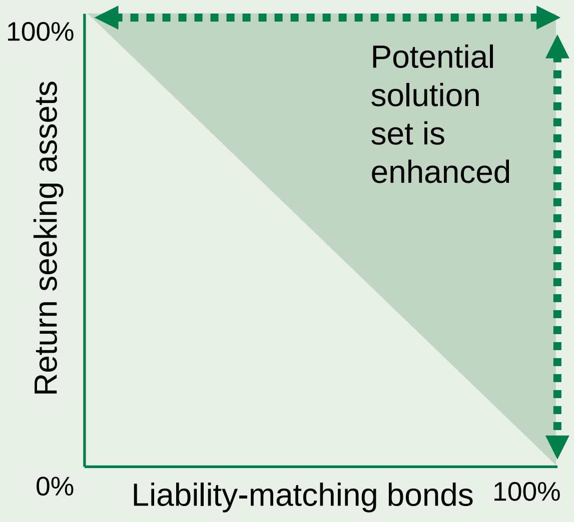
Traditional Investment Strategy Trade-Off

Growth Assets *or* "Bonds"



Adding Overlay

Growth Assets *and* "Bonds"



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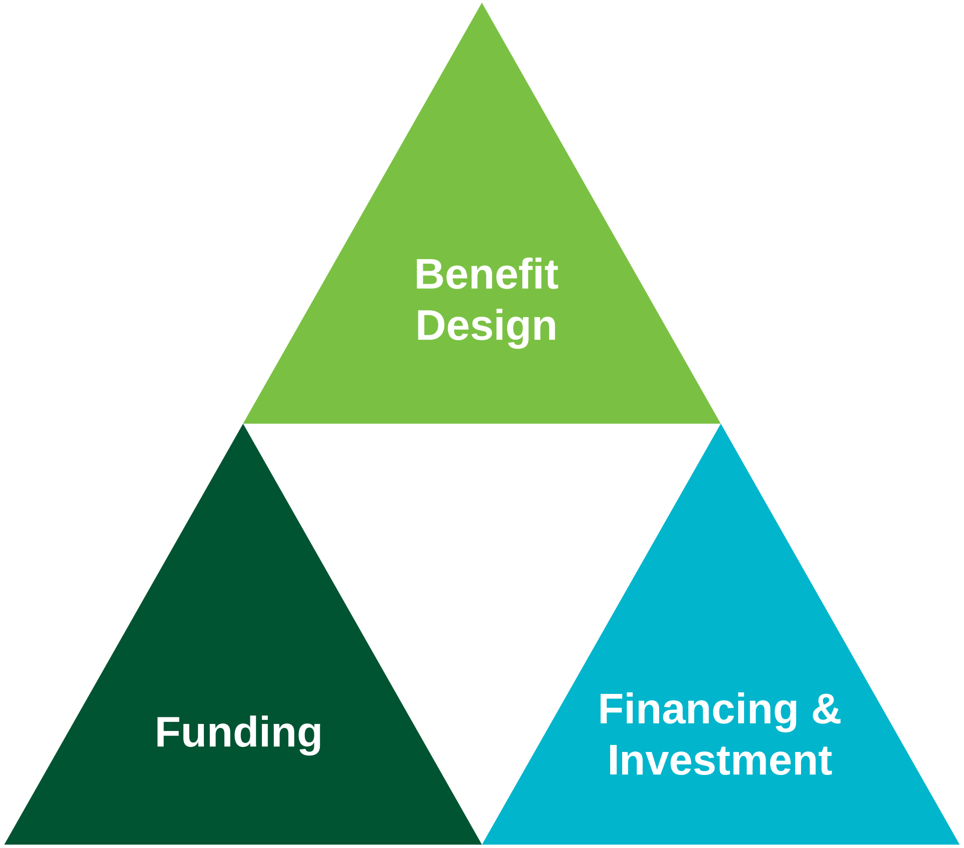
Corporate Policy Levers for Pension Strategy

- Pension Benefits are Cost of Compensation
- Funding is Typically a Timing Consideration
- Financing Policy & Investment is Influenced by Risk Capacity & Risk Appetite



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Impact of Potential Pension Funding Relief?

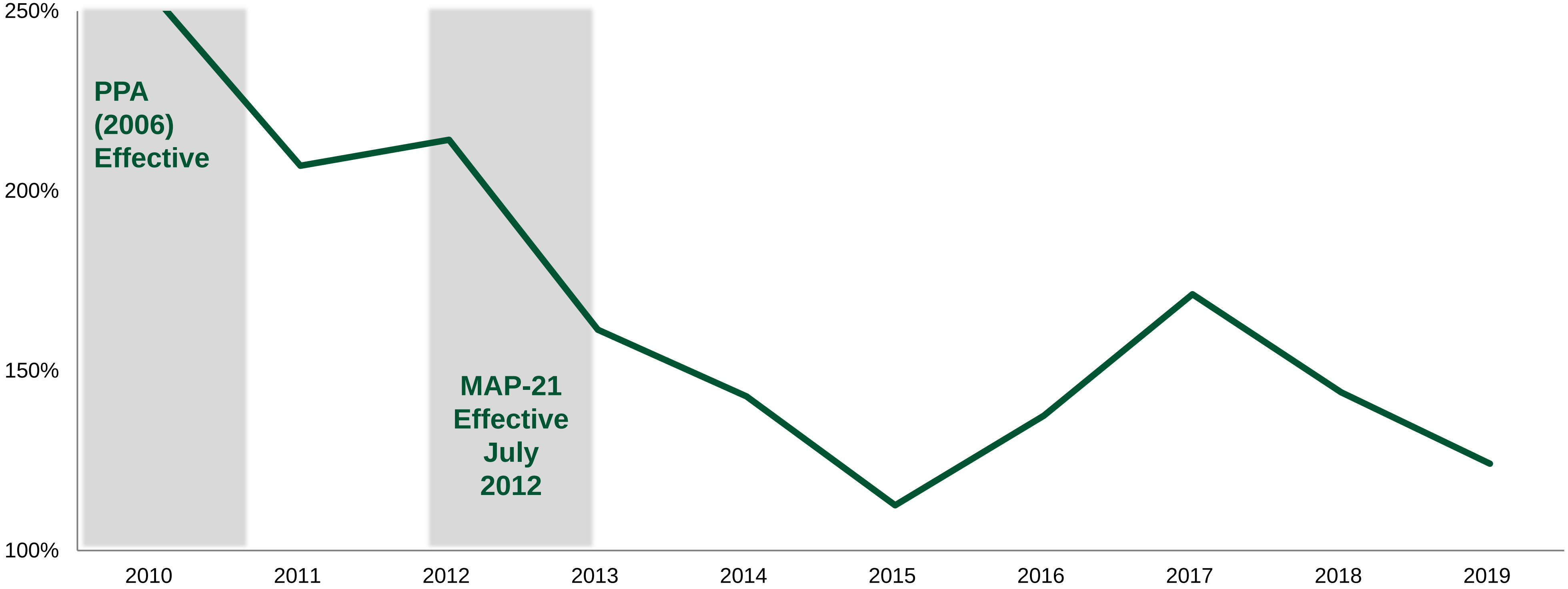
Polling Question 4

The Benefit Of Pension Funding Relief To My Situation Is To:

- **A** Mitigate Mandatory Contributions In The Near-Term
- **B** Mitigate All Future Need For Mandatory Contributions
- **C** Facilitate A More Stable Voluntary Contribution Policy Going Forward
- **D** Unsure / Other

The Goal of MAP-21 Funding Relief to Reduce the Contribution Burden Has Not Materialized

Ratio of Annual Contributions to Plan Service Costs from 2010 to 2019



Contributions have Averaged 170% of Service Cost Over the 10-year Period Ending FYE2019

Source: Bloomberg, Insight calculations. Information contained herein is derived from sources believed to be reliable. Insight does not guarantee or warrant the accuracy, timeliness, or completeness of the information either collected, sourced or otherwise provided, and is not responsible for any errors or omissions.

Similar Drivers of Pension Funding Relief – Then & Now

	MAP-21 2012	Potential Covid-19 Relief
Focus on Corporate Liquidity Post-GFC	☑	☑
Rates Viewed as "Artificially" Low	☑	☑
"Perfect Storm" of Falling Equity Markets and Falling Interest Rates	☑	?

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What Can We Do Different This Time Around to Ensure a Better Outcome?

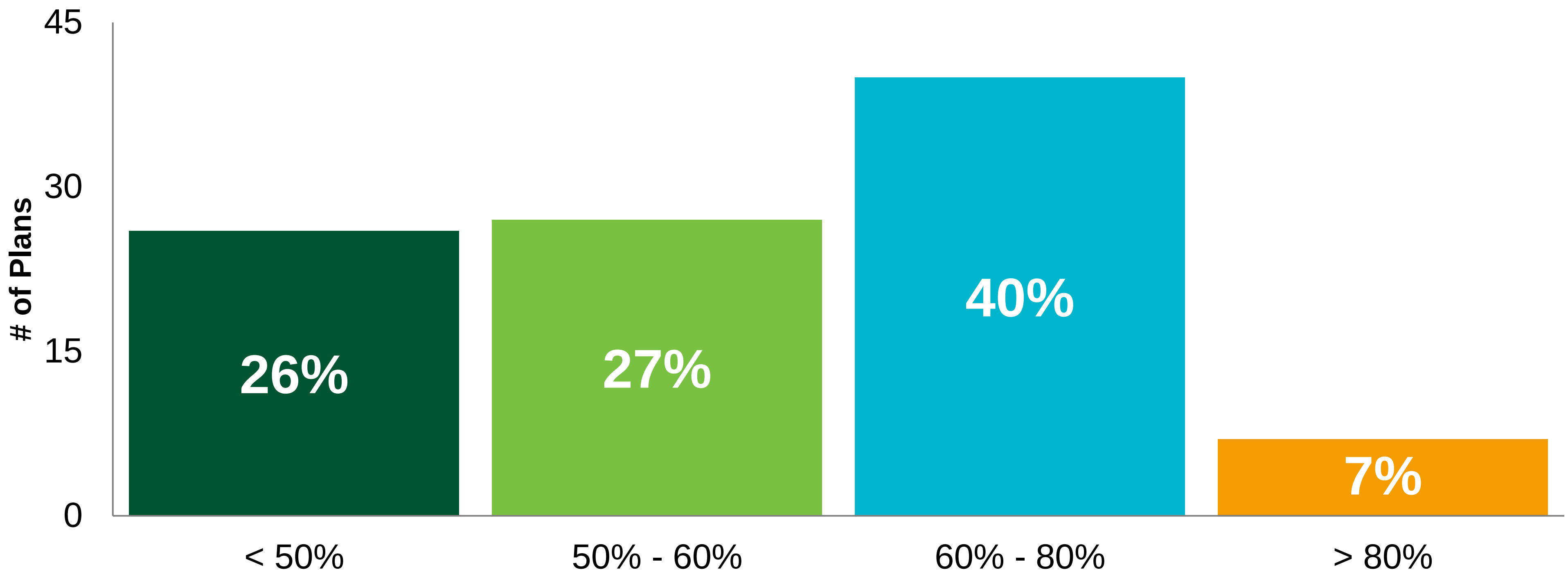
Potential Considerations

- How does Duration/Convexity Affect The Ability of Your Investment Strategy to Meet its Long Term Return?
- How has your Corporate Risk Appetite/Capacity Changed Post-COVID?
- Does Funding Relief Create Win-Win Opportunities To Balance Plan Sponsor and Fiduciary Objectives?
- Can the Potential Extension of Interest Rate Stabilization and Deficit Recovery Period Be Used to Better Manage the Trade-Off Between the Level of Returns and Projected Contributions?
- Does it make a Voluntary Contribution Policy Necessary?

Economics Will Ultimately Prevail As Plans Decumulate

Cash Outflows Are Becoming More Material

Next 10 Years of Cash Outflows as a % of Current Assets for Top 100 plans



Source: Bloomberg, Public Reports. Insight calculations, as of September 2020. Universe includes Top 100 largest DB plans by PBO in the S&P 500. Information contained herein is derived from sources believed to be reliable. Insight does not guarantee or warrant the accuracy, timeliness, or completeness of the information either collected, sourced or otherwise provided, and is not responsible for any errors or omissions.

Closing Remarks

CIEBA January Virtual Working Group Meeting
What Considerations Does A Lower Rate Environment Mean For Both DB Plans & Their Sponsors?

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Asset Allocation in a Low Yield Environment

Prepared for CIEBA

Private and Confidential

January 2021

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Low Yields and Defined Benefit Plans

Are Bonds of Any Use?

Today’s U.S. Treasury 10-year Yield:

1.05%

Source: Bloomberg, AQR. 10-year Treasury Yield as of January 6, 2021.

You Affect Only Part of Your Portfolio's Total Return

The Fed sets the rest, and they've been setting it very low

What you earn for merely having money

Total Return = Risk-Free Rate + Excess Return

What your asset allocation earns for taking risk

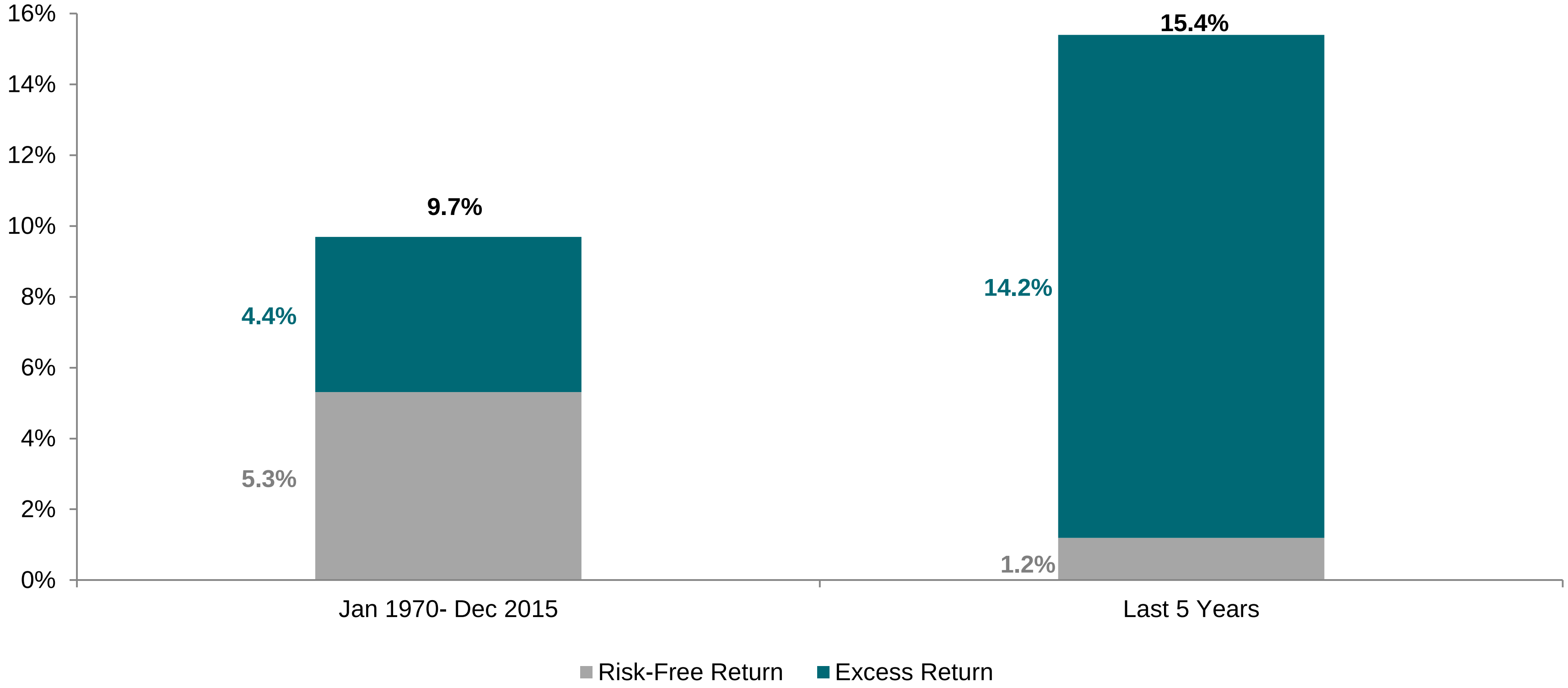
Source: AQR. For illustrative purposes only.

A Strong Equity Market Has Masked the Low-Rate Issue

Equity risk has recently paid more than three times its longer-term average

U.S. Equities Realized Total Return

January 1970 – December 2020



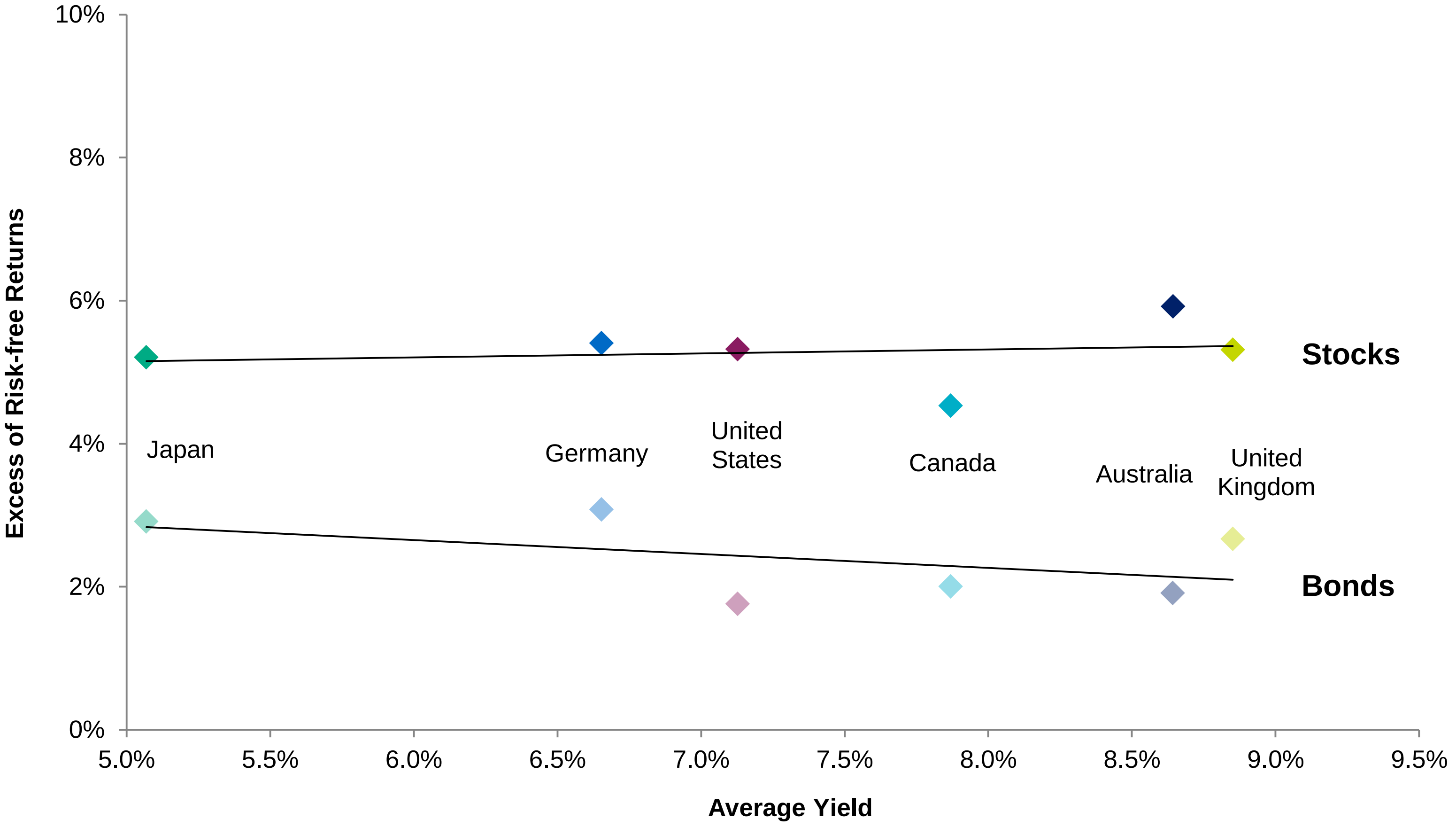
Source: AQR, Bloomberg. Data from January 1, 1970 – December 31, 2020. U.S. Equities is the S&P 500 Index. 3-Month T-Bills is the Federal Funds Rate 3-month T-Bill Index used to proxy the cash rate. Please read important disclosures in the Appendix. Past performance is not a guarantee of future performance.

Unfortunately, Low Rates Don't Give us Better Expectations

The *level* of rates doesn't seem to affect excess returns or optimal allocation

Excess of Risk-free Returns vs. Average Yield

January 1966 – March 2020

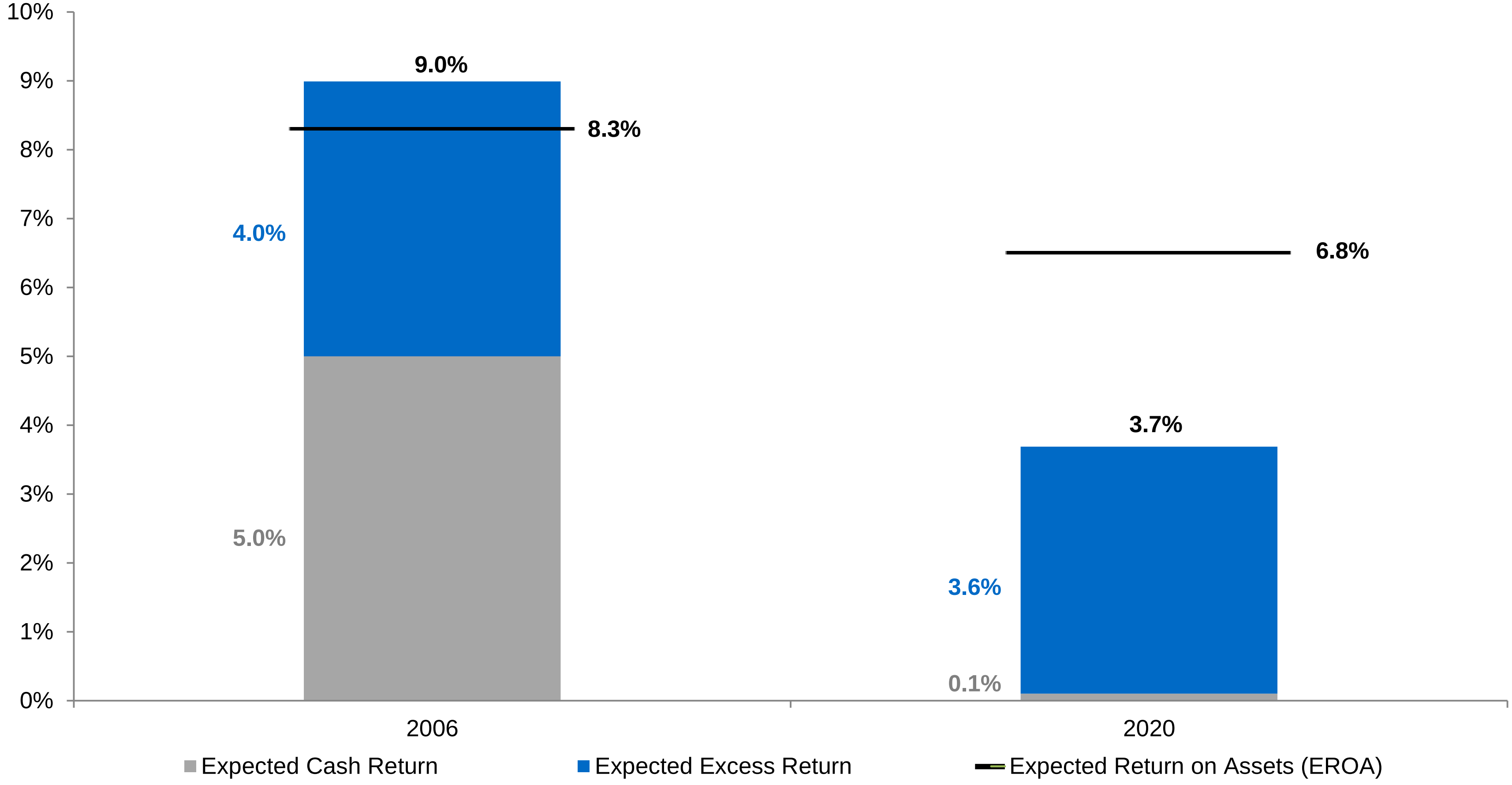


Source: AQR, Global Financial Data, DataStream, MSCI, Ibbotson, Bloomberg. Average excess return from May 1966 – March 2020. Average yield from May 1966 – March 2010. Bonds are government 10-year bond returns for G6 countries are defined as DataStream 10-Year Total Return indices and, prior to DataStream availability, Global Financial Data Total Return indices. Stocks are excess returns using MSCI and Ibbotson and, prior to their availability, Global Financial Data. Excess returns reflect 10-Year return projections. Please see the disclosures at the end of this presentation for more information on the index data used. Past performance is not a guarantee of future performance. Please read important disclosures in the Appendix.

So We Should Expect It to Be Harder to Achieve Return Goals

The impact of today's ultra-low risk-free rate is overwhelming

U.S. Corporate Pension EROA and Portfolio "expected return"



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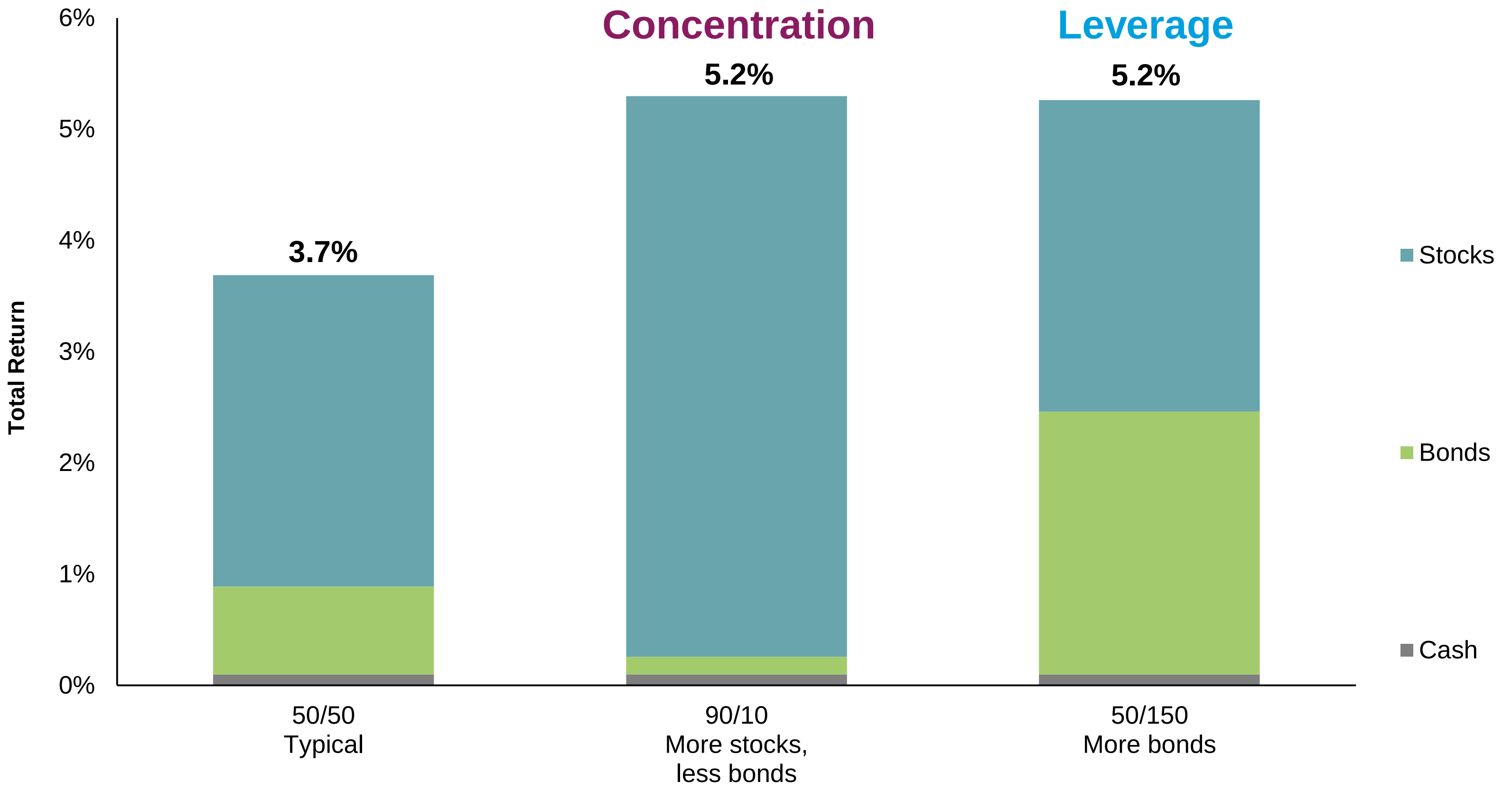
Source: AQR, Milliman, Bloomberg. Expected return on assets (EROA) and asset allocations for U.S. corporate pensions acquired from the 2020 and 2010 Corporate Pension Funding Study published by Milliman. Expected cash return is the prevailing yield of 3-month U.S. Treasury Bills on December 31st 2006 and the same for 2020. Expected excess returns is calculated using the asset allocation in each year and the long-term ex-ante assumptions for stocks, bonds and alternatives volatility and Sharpe Ratio included in the Appendix. For illustrative purposes only. Hypothetical data has inherent limitations some of which are disclosed in the Appendix. There is no guarantee that these expected returns will be achieved.

Two Primary Tools to Raise Returns: Concentration and Leverage

Concentration is very popular; leverage isn't

Expected Return Contributions



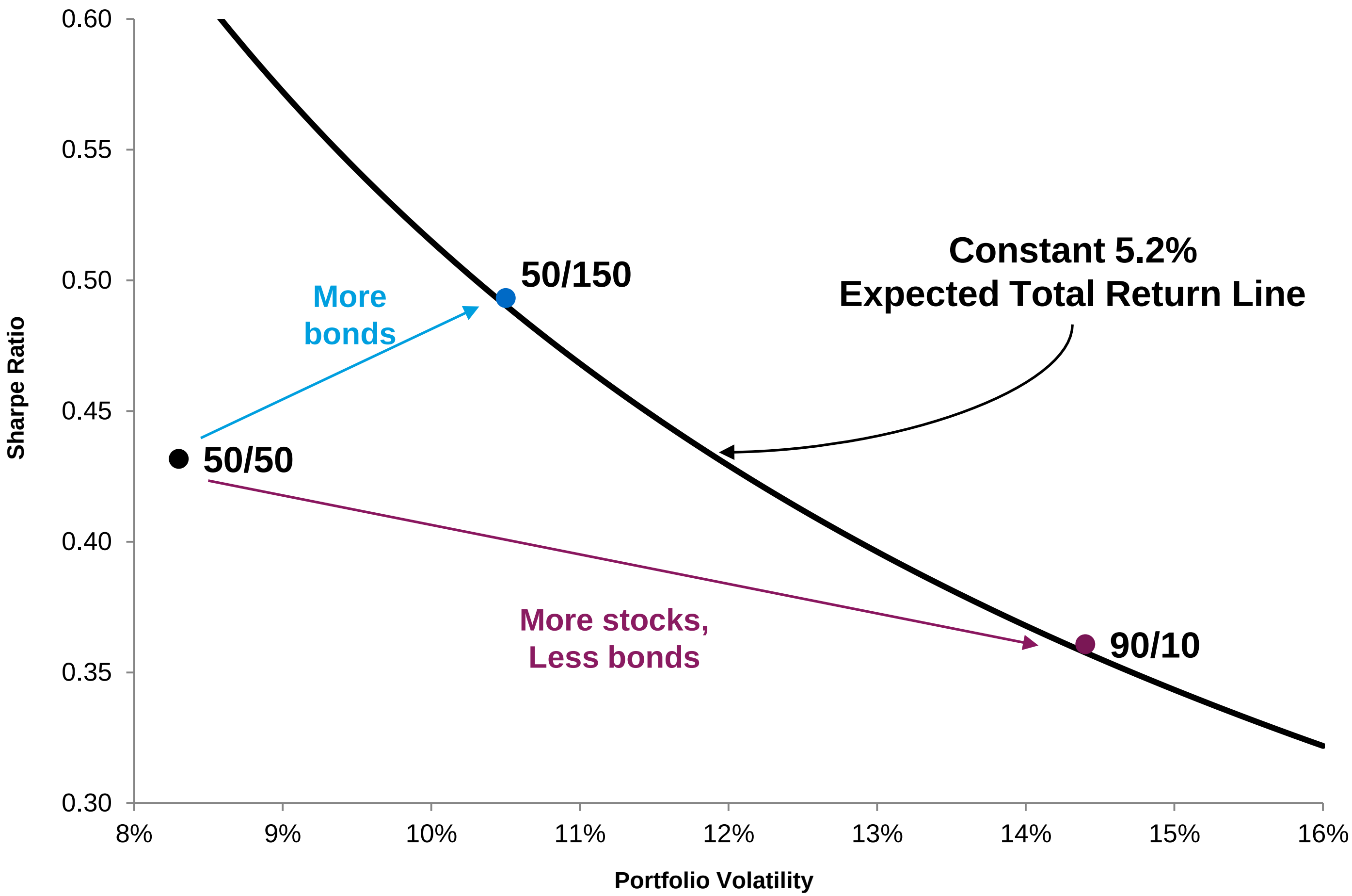
Expected Risk **8.3%** **14.4%** **10.5%**

Source: AQR, Milliman, Bloomberg. Expected cash return is the prevailing yield of 3-month U.S. Treasury Bills on December 31st 2019. Average excess return for stocks and bonds approximated using the MSCI World Index and Barclay's Global Aggregate Index from January 1990-June 2020 and Barclay's U.S. Aggregate Index from 1972-1989 for stocks and bonds respectively. Stock and bond volatility are based on long-term averages and the correlation is based on the recent prevailing level. Please see Appendix for additional information. For illustrative purposes only. Hypothetical data has inherent limitations some of which are disclosed in the Appendix. There is no guarantee that these expected returns will be achieved..

Concentration or Leverage?

Concentration is very popular; maybe it shouldn't be

Hypothetical 50/50, 90/10 and 50/150 stock/bond portfolios volatility vs. Sharpe Ratio



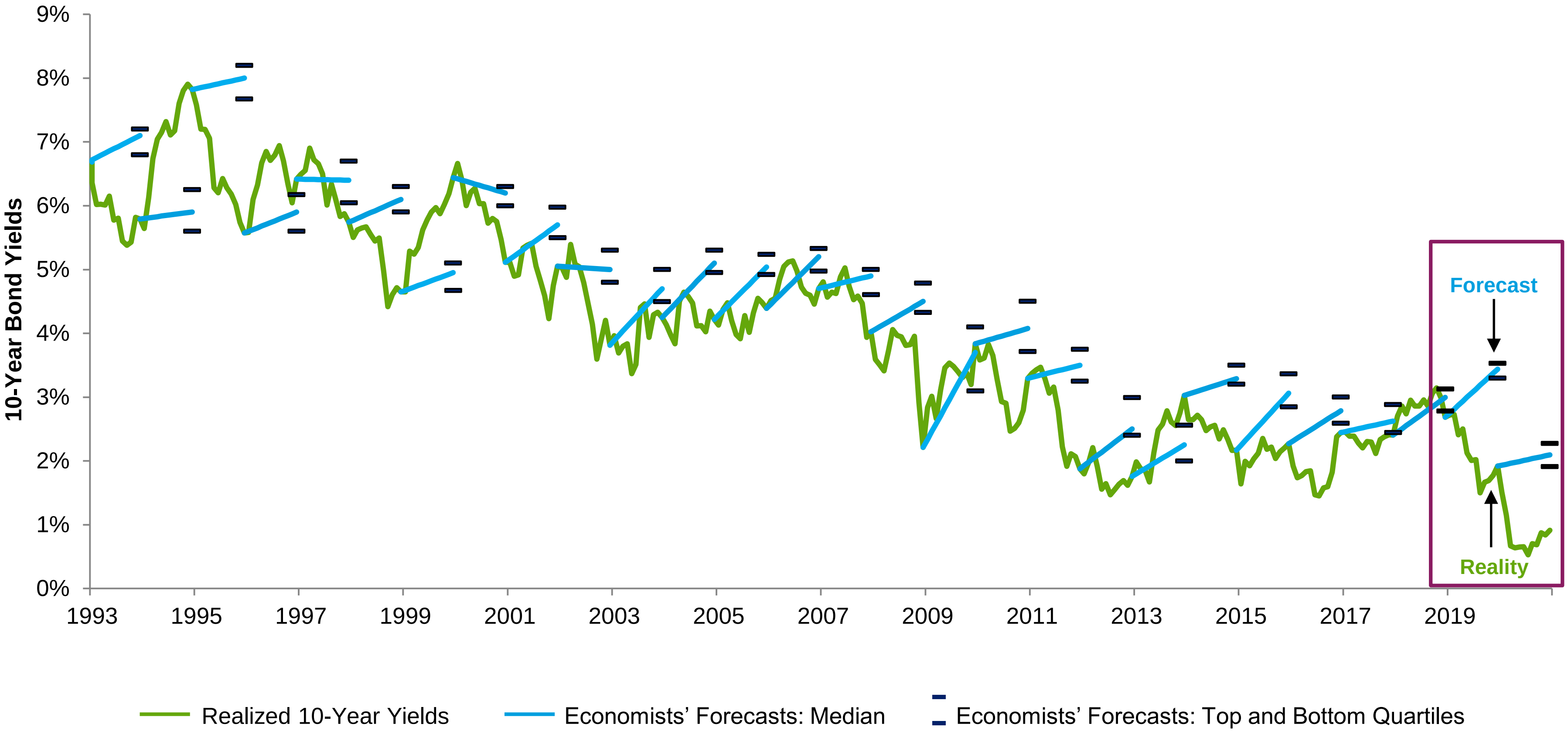
Source: AQR, Milliman, Bloomberg. Expected cash return is the prevailing yield of 3-month U.S. Treasury Bills on December 31st 2019. Average excess return for stocks and bonds approximated using the MSCI World Index and Barclay's Global Aggregate Index from January 1990-June 2020 and Barclay's U.S. Aggregate Index from 1972-1989 for stocks and bonds respectively. Stock and bond volatility are based on long-term averages and the correlation is based on the recent prevailing level. Please see Appendix for additional information. For illustrative purposes only. Hypothetical data has inherent limitations some of which are disclosed in the Appendix. There is no guarantee that these expected returns will be achieved..

But Are Yields Are So Low that Bonds Are Certain Losers?

Forecasters are calling for yet another increase in yields ☺

U.S. Treasury Historical 10-Year Yield versus Economists' Forecasts

January 1993 – December 2020



Source: AQR, Consensus Economics, Bloomberg. Economists' forecasts are based on linear interpolation of beginning of 12 month forecast at the start of each calendar year. Estimate error in Economists' forecasts is the difference in yields. Past performance is not a guarantee of future performance. Please read important disclosures in the Appendix.

Yields May or May Not Fall, But Some Reasons Why They Might

Realistic paths for the economy could apply downward pressure

Real yields, sensitive to real economic activity, can still fall substantially

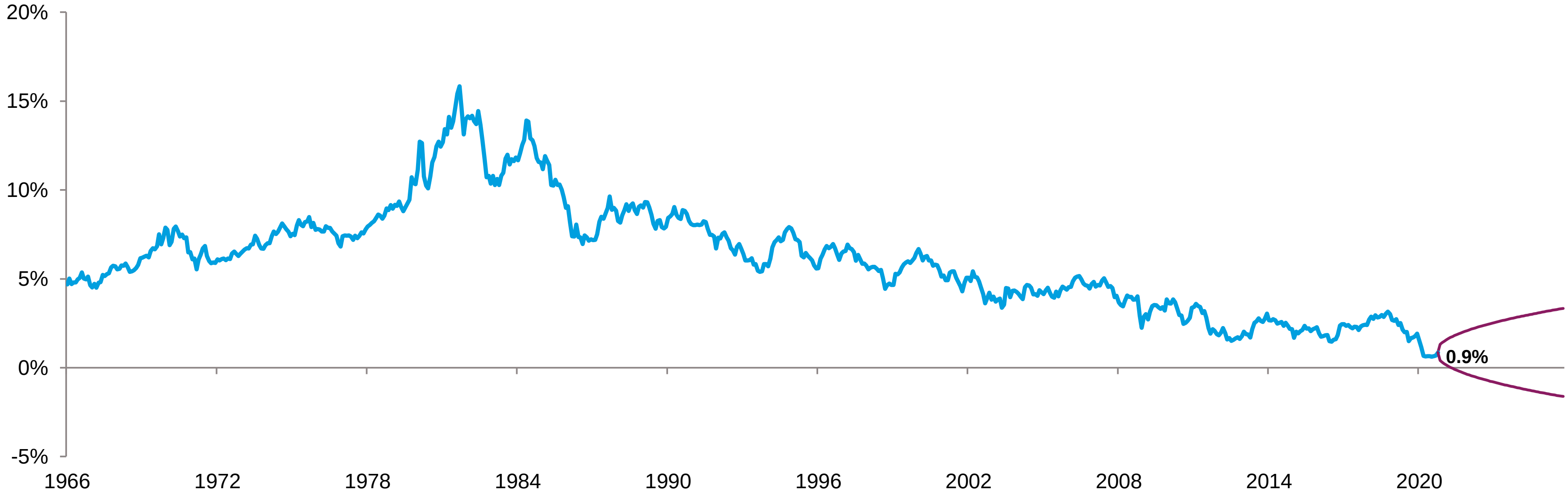
- Coronavirus vaccine distribution delay, slower than expected recovery
- Declines in labor productivity and population growth

Deflation, with economic activity slowed down in much of the world, is a possibility

- A long recovery for labor markets would put downward pressure on wage inflation and aggregate demand

Historical U.S. 10-Year Yields with Range of Possible Future Yields

January 1966 – October 2020

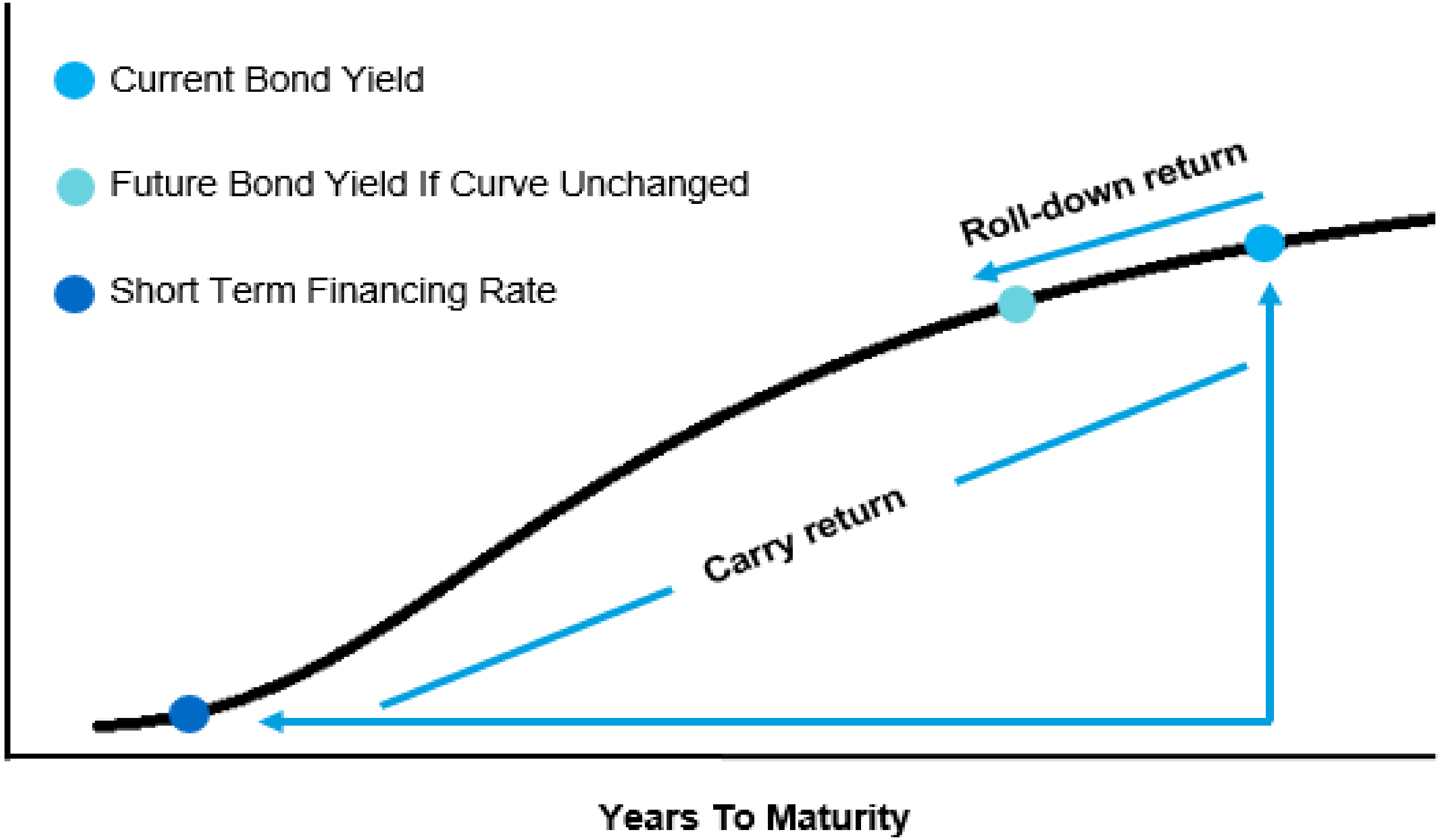


Source: AQR, Bloomberg. U.S. 10 Year Treasury yields from January 1, 1966 to October 31, 2020. Range of potential yield outcomes is for illustrative purposes only. Past performance is not a guarantee of future performance.

But Yields Don't Even Have to Fall for Bonds to Make Money

Decent returns still can be had from borrowing short and lending long

Components of Bond Returns If Yields are Unchanged



Source: AQR. For illustrative purposes only.

And Short Rates Can Go Lower

Zero isn't a lower bound, it's an opinion

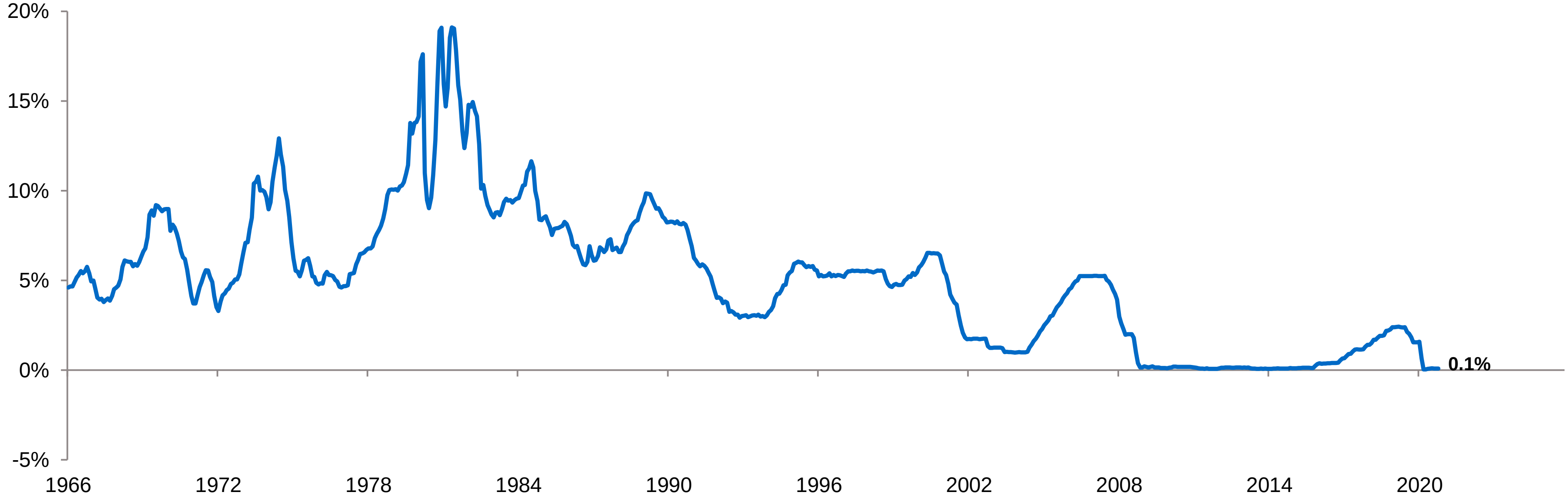
Paper money hoarding won't prevent negative rates; large cash holders can't hold paper money

Market plumbing problems with negative rates can be resolved

Today's Fed doesn't like negative rates, but circumstances change and the Fed can change, too

Historical Effective Fed Funds Rate

January 1966 – October 2020



Source: AQR, Consensus Economics, Bloomberg, Federal Reserve. For illustrative purposes only. Please read important disclosures in the Appendix.

Which Makes Bonds' Performance Potential Pretty Interesting

Especially for investors who can own them in a cash efficient way

Today's US Treasury 10-year Yield:

1.05%

Source: Bloomberg, AQR. 10-year Treasury yield, 9-year Treasury yield, and financing rate (3-month U.S. T-Bill) as of January 6, 2021.

Which Makes Bonds' Performance Potential Pretty Interesting

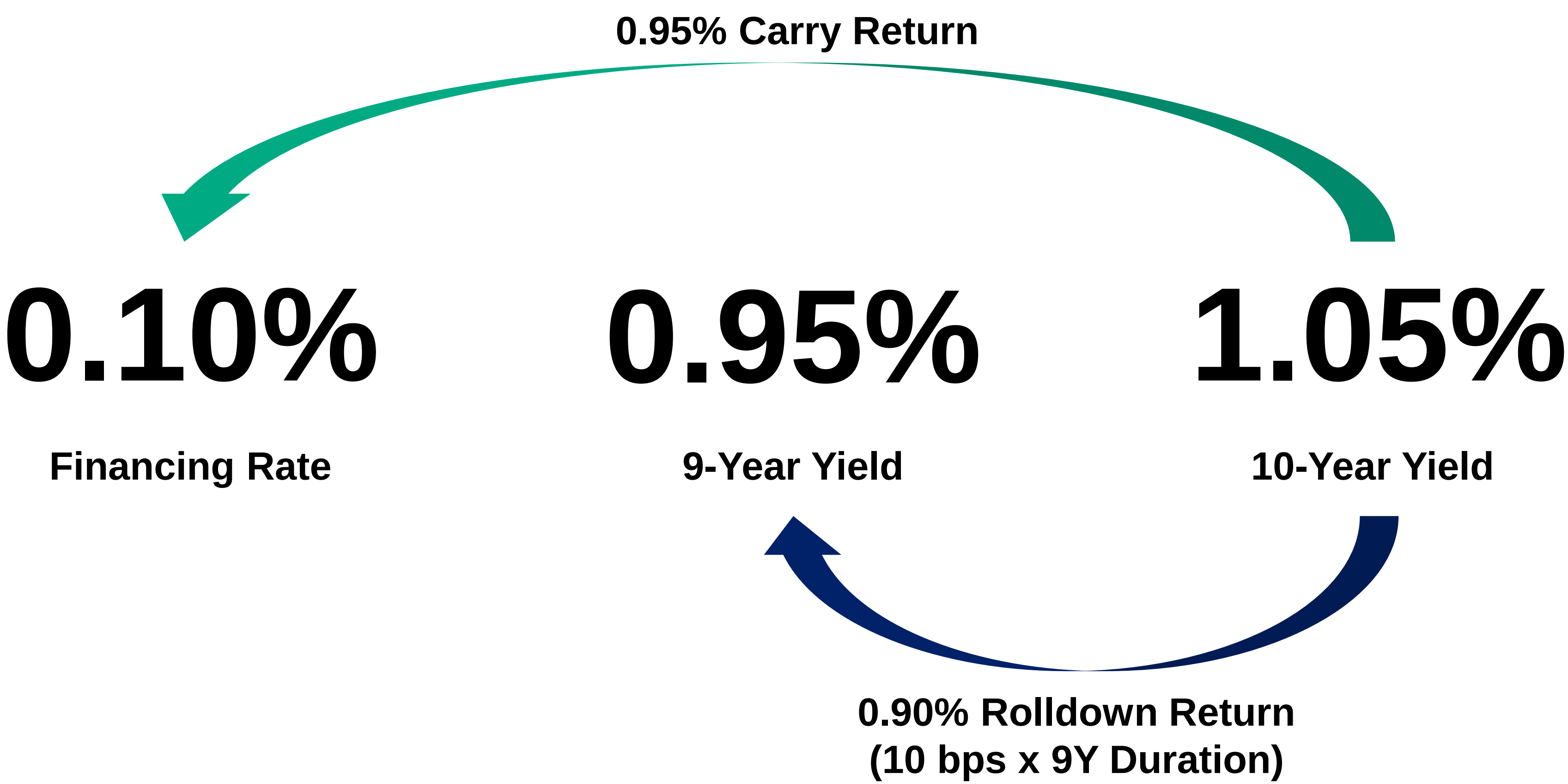
Especially for investors who can own them in a cash efficient way

0.10%	0.95%	1.05%
Financing Rate	**9-Year Yield**	**10-Year Yield**

Source: Bloomberg, AQR. 10-year Treasury yield, 9-year Treasury yield, and financing rate (3-month U.S. T-Bill) as of January 6, 2021.

Which Makes Bonds' Performance Potential Pretty Interesting

Especially for investors who can own them in a cash efficient way



Source: Bloomberg, AQR. 10-year Treasury yield, 9-year Treasury yield, and financing rate (3-month U.S. T-Bill) as of January 6, 2021.

Which Makes Bonds' Performance Potential Pretty Interesting

Especially for investors who can own them in a cash efficient way

In the absence of a view on yield changes, current U.S. bonds expectations are about what we expect in the long-term

0.10%	0.95%	1.05%
Financing Rate	9-Year Yield	10-Year Yield

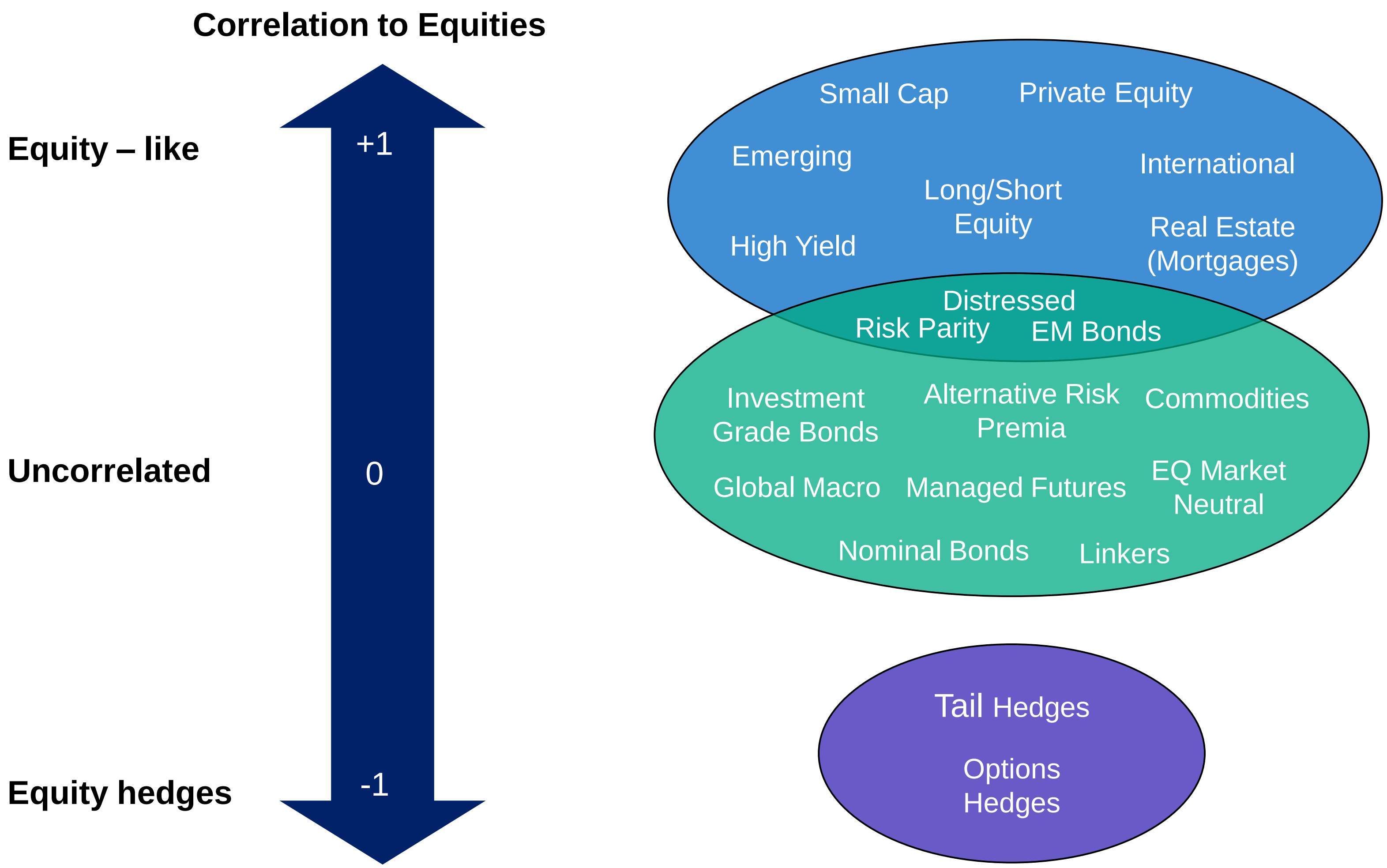
1.85% / **5.5%** = **0.34**

Static Excess Return (Carry + Rolldown)	Expected Volatility	Static Sharpe Ratio

Source: Bloomberg, AQR. 10-year Treasury yield, 9-year Treasury yield, and financing rate (3-month U.S. T-Bill) as of January 6, 2021.

Our Other Diversification Tools Still Highlight the Primary Conflict

The less they are like equities, the more they tend to need leverage to matter



Source: AQR. For illustrative purposes only.

How Can Defined Benefit Plans Deal With Low Rates?

Investors have few ways to counter punishment by "financial repression"

Expecting high returns with yesterday's portfolio and today's lower cash rates will be difficult

Take enough risk, but be wary of doubling up on exposure to economic growth

Don't shun leverage, you probably need it

- May be the only way you can make bonds (and other diversifiers) matter enough to reap their benefits

Consider taking more uncorrelated active risk to get more portfolio level alpha

- Reduce constraints on active managers or employ portable alpha strategies

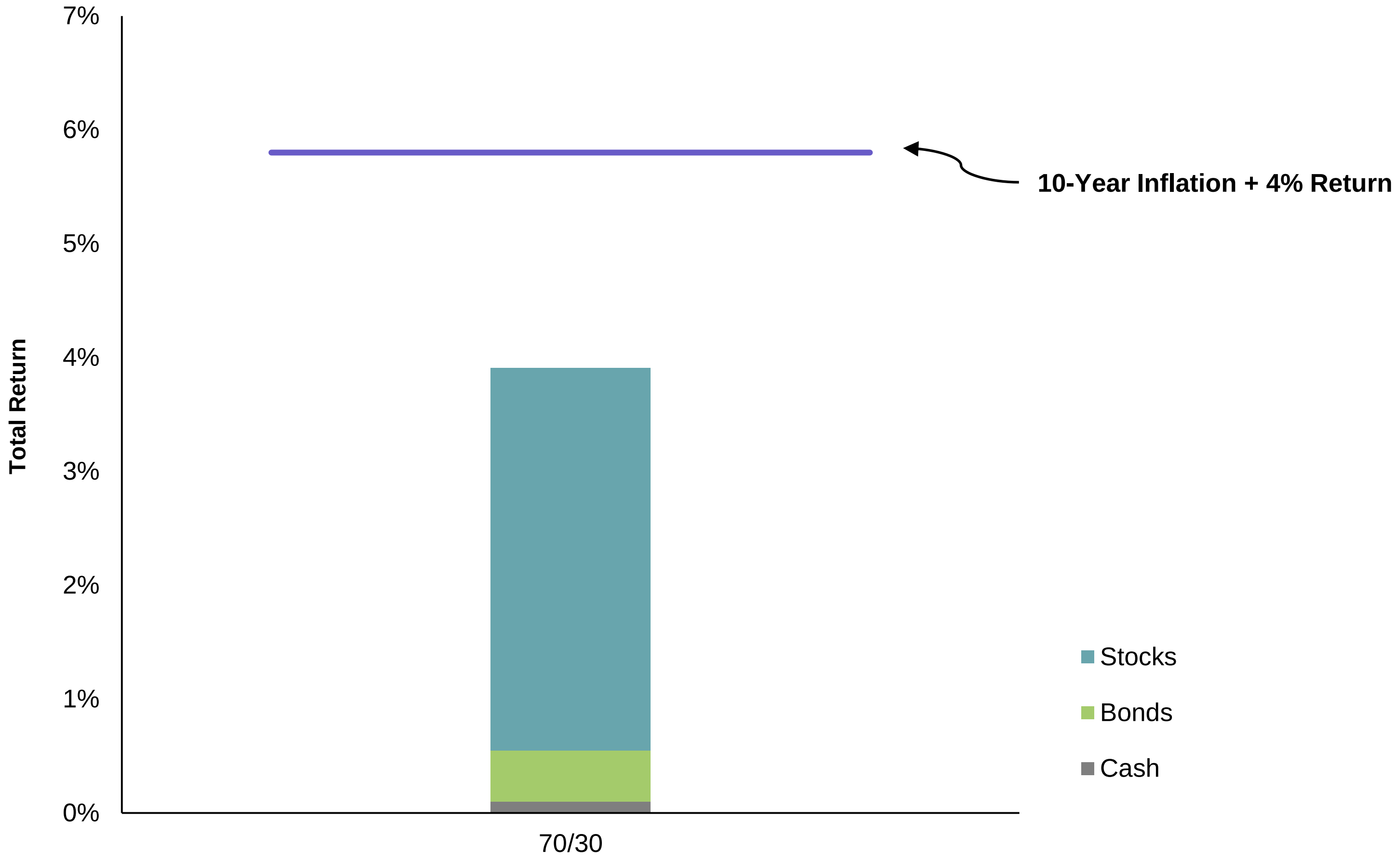
Source: AQR.

Low Yields and Defined Contribution Plans

Low Rates Make It Tough For Individual Savers, Too

Savers are punished when cash rates are below the rate of inflation

Expected Return Contribution for a 70/30 Stock/Bond Portfolio

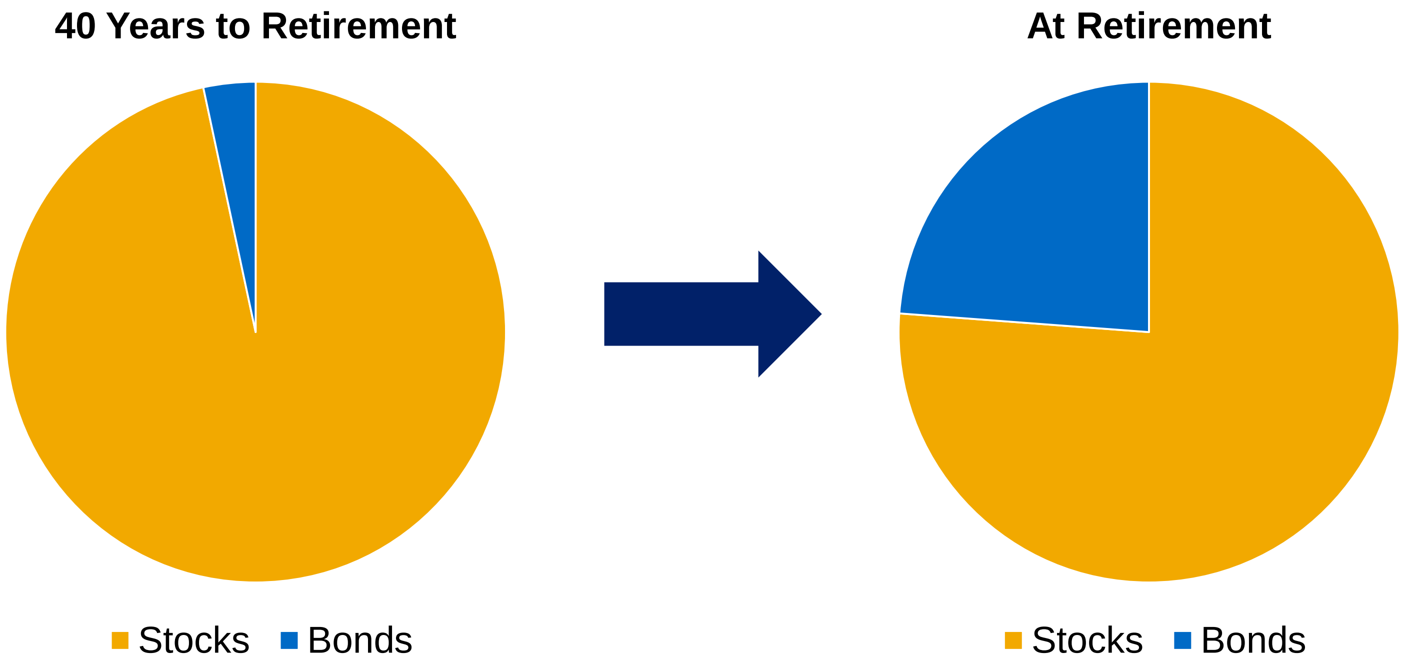


Source: AQR, Bloomberg. Data as of December 31, 2020. Expected return for 70% Stock and 30% Bond portfolio based on prevailing 3-Month Treasury bill yield for Cash and long-term Sharpe ratio and volatility assumptions for stocks and bonds included in the Appendix. Inflation is based on the 10-Year U.S. Breakeven Inflation Index. For illustrative purposes only and not representative of a portfolio AQR currently manages.

The TDF Solution is Concentration - Across the *Entire* Glide Path

Our DC retirement system is almost fully dependent on equity returns

Hypothetical TDF Risk Allocation



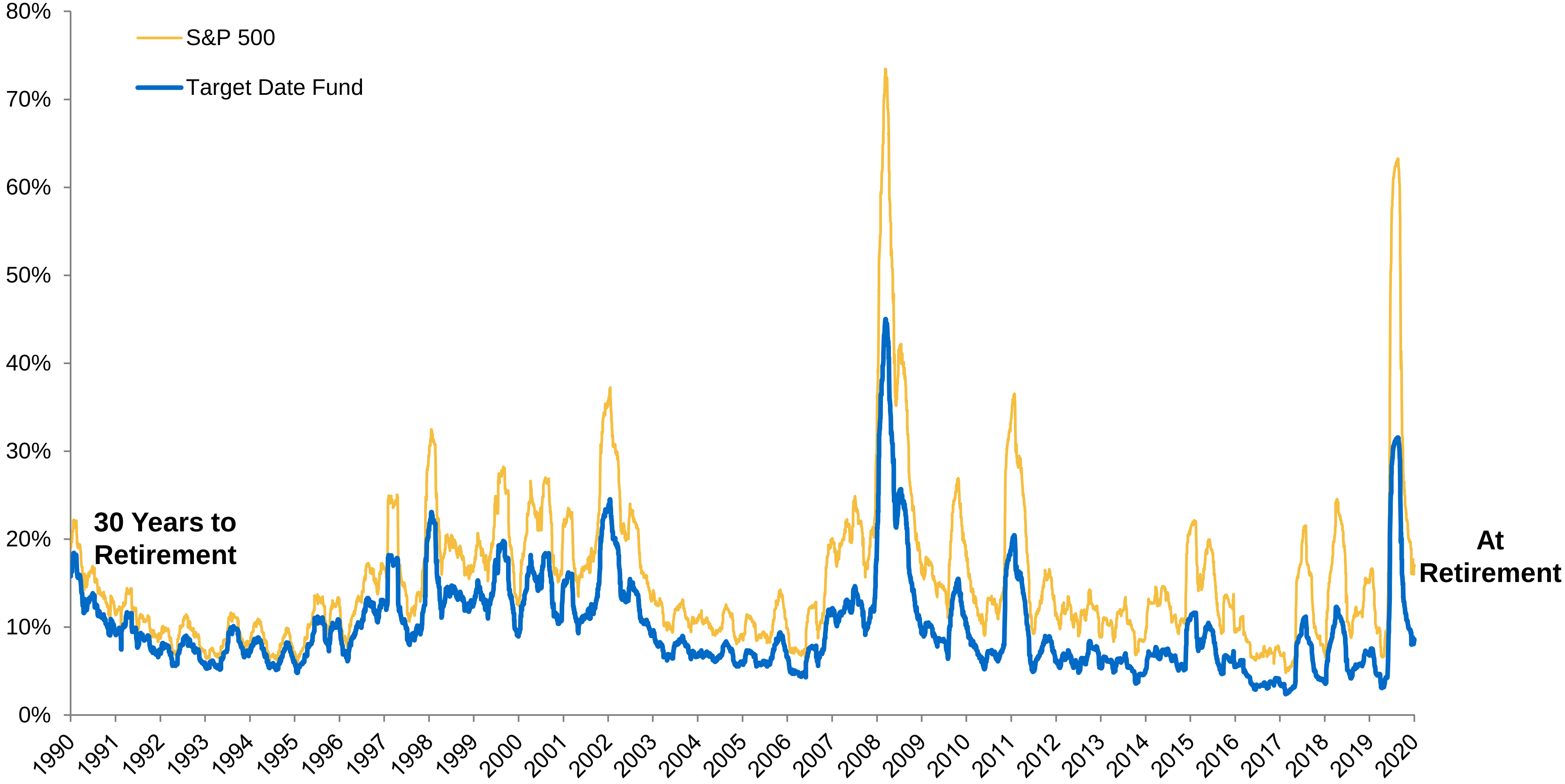
Source: AQR. This assumes investment in a stock/bond glidepath, which transitions from a 90/10 stock/bond mix to a 50/50 stock/bond mix at retirement over a 40 year glidepath. To calculate risk allocation we assume a 16% volatility for stocks and a 5% volatility for bonds and a zero correlation between stocks and bonds. For illustrative purposes only and not representative of a portfolio AQR currently manages. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix.

It's Not Really a Risk Glide Path, It's a Dilution Glide Path

Portfolio risk varies wildly along the path; always driven by stocks

Target Date Fund and S&P 500 Volatility

For Hypothetical TDF Participant Starting 30 Years Ago

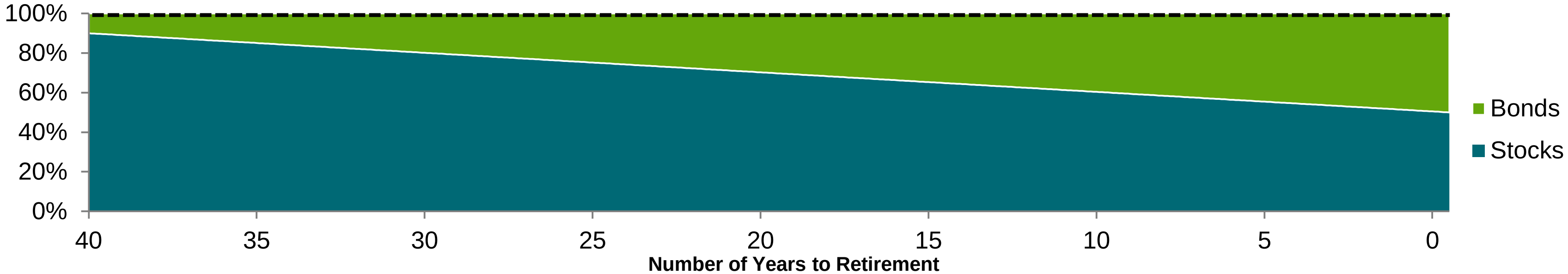


Source: AQR, Bloomberg. Data from September 1990 to September 2020. The Target Date Fund assumes investment in a stock/bond glidepath, which transitions from a 80/20 stock/bond mix to a 50/50 stock/bond mix at retirement over a 30 year glidepath. Stocks is based on the S&P 500 Index. Bonds is based on the Barclays US Aggregate Index. Rolling realized annualized standard deviation of daily returns of S&P 500 Index and the Target Date Fund over a 60-day horizon. For illustrative purposes only and not representative of a portfolio AQR currently manages.

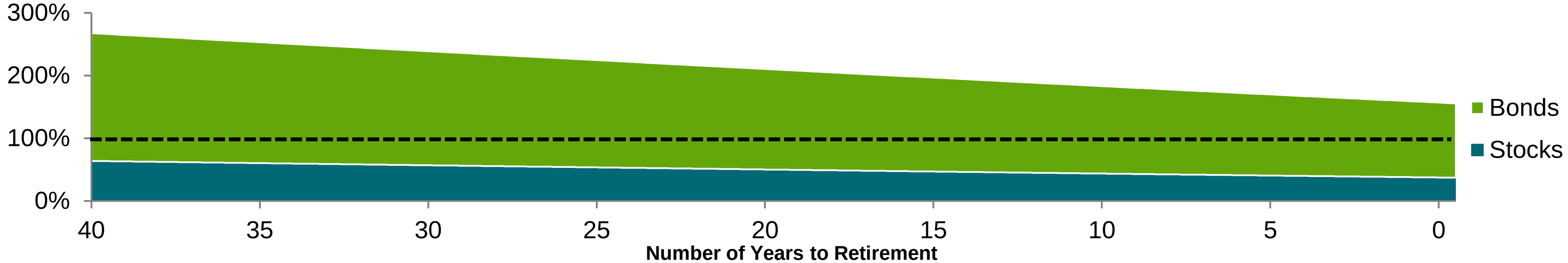
An Improved TDF Probably Requires Leverage

Separating risk target and asset allocation could make for better portfolios

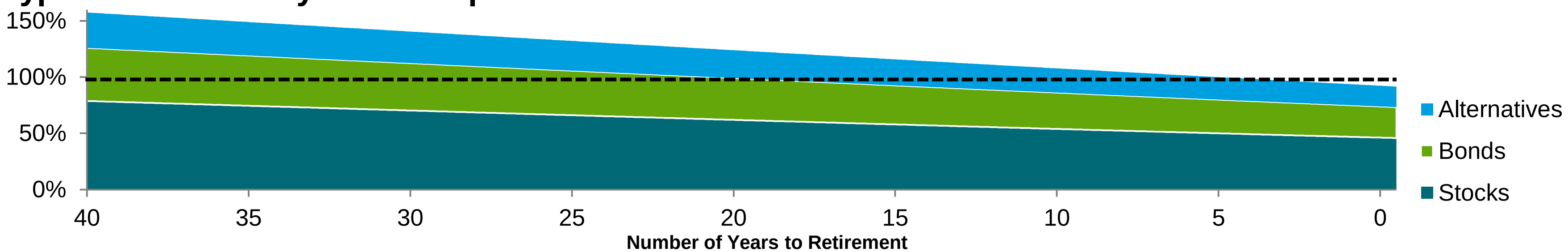
Hypothetical Traditional TDF Capital Allocation Glidepath



Hypothetical Risk Balanced TDF Capital Allocation



Hypothetical DB-Style TDF Capital Allocation



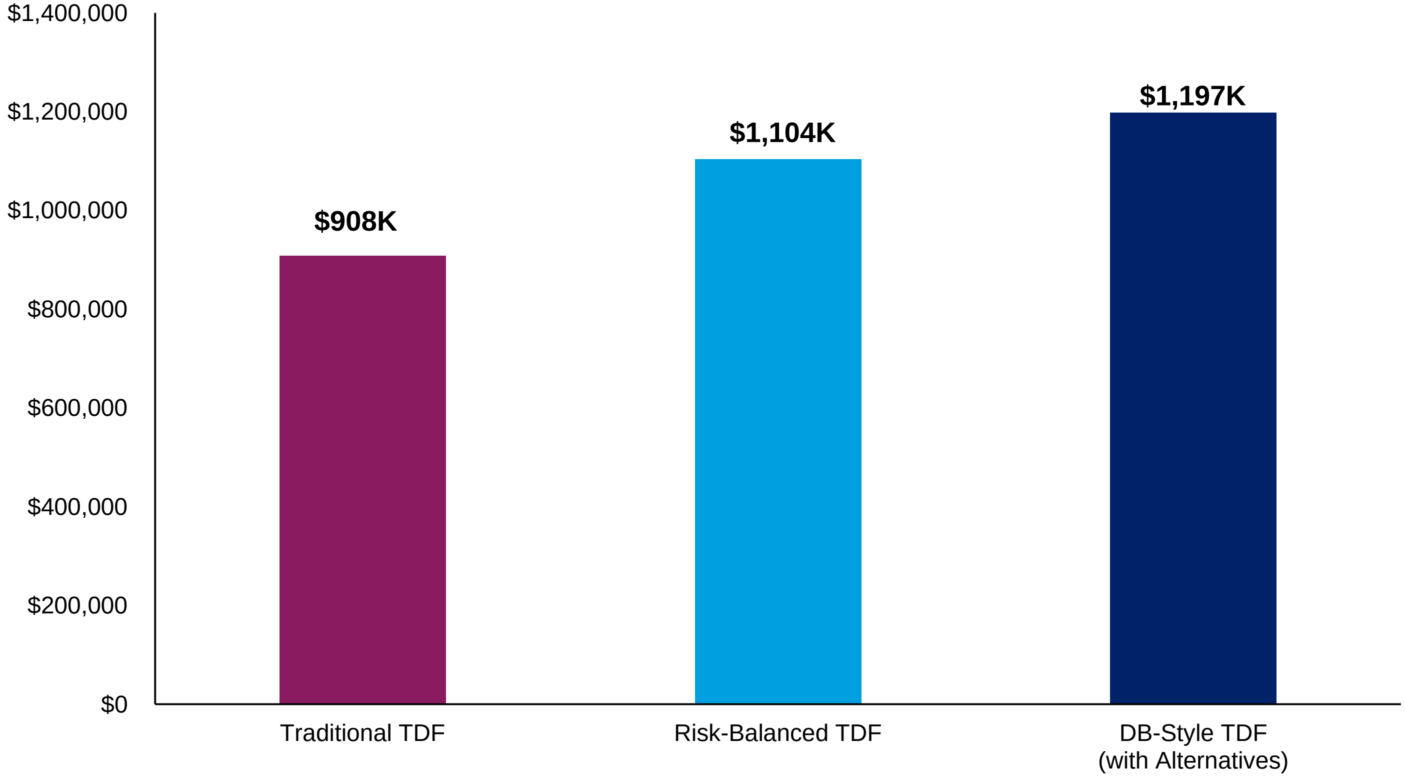
Source: AQR. For illustrative purposes only. US 40 Years to Retirement TDF is comprised of a 90%/10% equity/bond allocation. US At Retirement TDF is comprised of a 50%/50% equity/bond allocation. These allocations were determined by the average recommended asset allocation from the three largest providers based on the 2019 PLANSPONSOR TDF Survey: Vanguard, Fidelity, and T. Rowe Price. Risk Balanced and DB-Style TDF capital allocations target the same level of portfolio volatility implied by the traditional TDF at each point in time. Total Risk is calculated based on the Ex-Ante risk and correlation assumptions for stocks, bonds and alternatives. For illustrative purposes only and not representative of any portfolio that AQR currently manages. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix. Please read important disclosures in the Appendix.

The Potential for Improved Outcomes Is Large

Sure there are issues, but our current programs tend to be so extreme

We assume the average employee starts with a $50K salary that grows 3% a year and saves 8%

Simulated Average Accumulated Savings at Retirement



Source: AQR. For illustrative purposes only and not representative of any specific defined-benefit plan. Long-term return and volatility are based on assumptions for stocks, bonds and alternatives included in the Appendix. Cash returns are assumed to be 2% per year. No representation is being made that the results of the analysis will be successful or profitable. Sharpe and volatility assumptions are subject to change at any time without notice. Hypothetical portfolio results are for illustrative purposes only. No representation is being made that any investment will achieve performance similar to those shown. In fact, there are frequently sharp differences between hypothetical results and the actual results subsequently realized by any particular model. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix.

Disclosures

Performance Disclosures

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PAST PERFORMANCE IS NOT A GUARANTEE OF FUTURE PERFORMANCE. Diversification does not eliminate the risk of experiencing investment losses.

HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH, BUT NOT ALL, ARE DESCRIBED HEREIN. NO REPRESENTATION IS BEING MADE THAT ANY FUND OR ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN HEREIN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY REALIZED BY ANY PARTICULAR TRADING PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR TO ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS THAT CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS, ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS. The hypothetical performance results contained herein represent the application of the quantitative models as currently in effect on the date first written above and there can be no assurance that the models will remain the same in the future or that an application of the current models in the future will produce similar results because the relevant market and economic conditions that prevailed during the hypothetical performance period will not necessarily recur. Discounting factors may be applied to reduce suspected anomalies. This backtest's return, for this period, may vary depending on the date it is run. Hypothetical performance results are presented for illustrative purposes only. In addition, our transaction cost assumptions utilized in backtests, where noted, are based on AQR Capital Management, LLC's, ("AQR")'s historical realized transaction costs and market data. Certain of the assumptions have been made for modeling purposes and are unlikely to be realized. No representation or warranty is made as to the reasonableness of the assumptions made or that all assumptions used in achieving the returns have been stated or fully considered. Changes in the assumptions may have a material impact on the hypothetical returns presented. Actual advisory fees for products offering this strategy may vary.

Gross performance results do not reflect the deduction of investment advisory fees, which would reduce an investor's actual return. For example, assume that $1 million is invested in an account with the Firm, and this account achieves a 10% compounded annualized return, gross of fees, for five years. At the end of five years that account would grow to $1,610,510 before the deduction of management fees. Assuming management fees of 1.00% per year are deducted monthly from the account, the value of the account at the end of five years would be $1,532,886 and the annualized rate of return would be 8.92%. For a 10-year period, the ending dollar values before and after fees would be $2,593,742 and $2,349,739, respectively. AQR's asset based fees may range up to 2.85% of assets under management, and are generally billed monthly or quarterly at the commencement of the calendar month or quarter during which AQR will perform the services to which the fees relate. Where applicable, performance fees are generally equal to 20% of net realized and unrealized profits each year, after restoration of any losses carried forward from prior years. In addition, AQR funds incur expenses (including start-up, legal, accounting, audit, administrative and regulatory expenses) and may have redemption or withdrawal charges up to 2% based on gross redemption or withdrawal proceeds. Please refer to AQR's ADV Part 2A for more information on fees. Consultants supplied with gross results are to use this data in accordance with SEC, CFTC, NFA or the applicable jurisdiction's guidelines.

There is a risk of substantial loss associated with trading commodities, futures, options, derivatives and other financial instruments. Before trading, investors should carefully consider their financial position and risk tolerance to determine if the proposed trading style is appropriate. Investors should realize that when trading futures, commodities, options, derivatives and other financial instruments one could lose the full balance of their account. It is also possible to lose more than the initial deposit when trading derivatives or using leverage. All funds committed to such a trading strategy should be purely risk capital.

Request ID: 321988

Performance Disclosures

Broad-based securities indices are unmanaged and are not subject to fees and expenses typically associated with managed accounts or investment funds. Investments cannot be made directly in an index.

Indices presented herein:

The S&P 500 Index is the Standard & Poor's composite index of 500 stocks, a widely recognized, unmanaged index of common stock prices.

The MSCI World Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets.

The Bloomberg Barclays Global Aggregate Bond Index is a flagship measure of global investment grade debt from 23 different local currency markets. This multicurrency benchmark includes fixed-rate Treasury, government-related, corporate and securitized bonds from both developed and emerging markets issuers.

Barclays U.S. Aggregate is a broad base bond market index representing intermediate term investment grade bonds traded in United States.

Capital Market Assumptions

Long-term Ex-ante Return and Volatility Assumptions

Asset Class	Excess Return Assumption	Volatility Assumption	Sharpe Ratio Assumption
Stocks	5.3%	16%	0.33
Bonds	1.8%	5.5%	0.33
Alternatives	5.3%	11%	0.48

Correlation Assumptions

	Stocks	Bonds	Alternatives
Stocks	1.0	0.0	0.5
Bonds	0.0	1.0	0.2
Alternatives	0.5	0.2	1.0

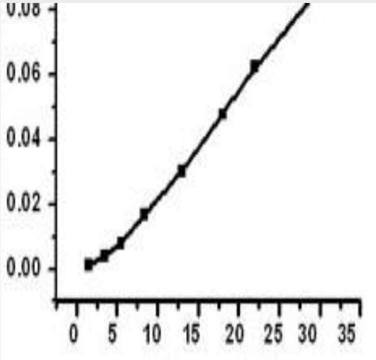
AQR

Cyber Security Disclosures

The SPARK Institute

Contents

Background & History

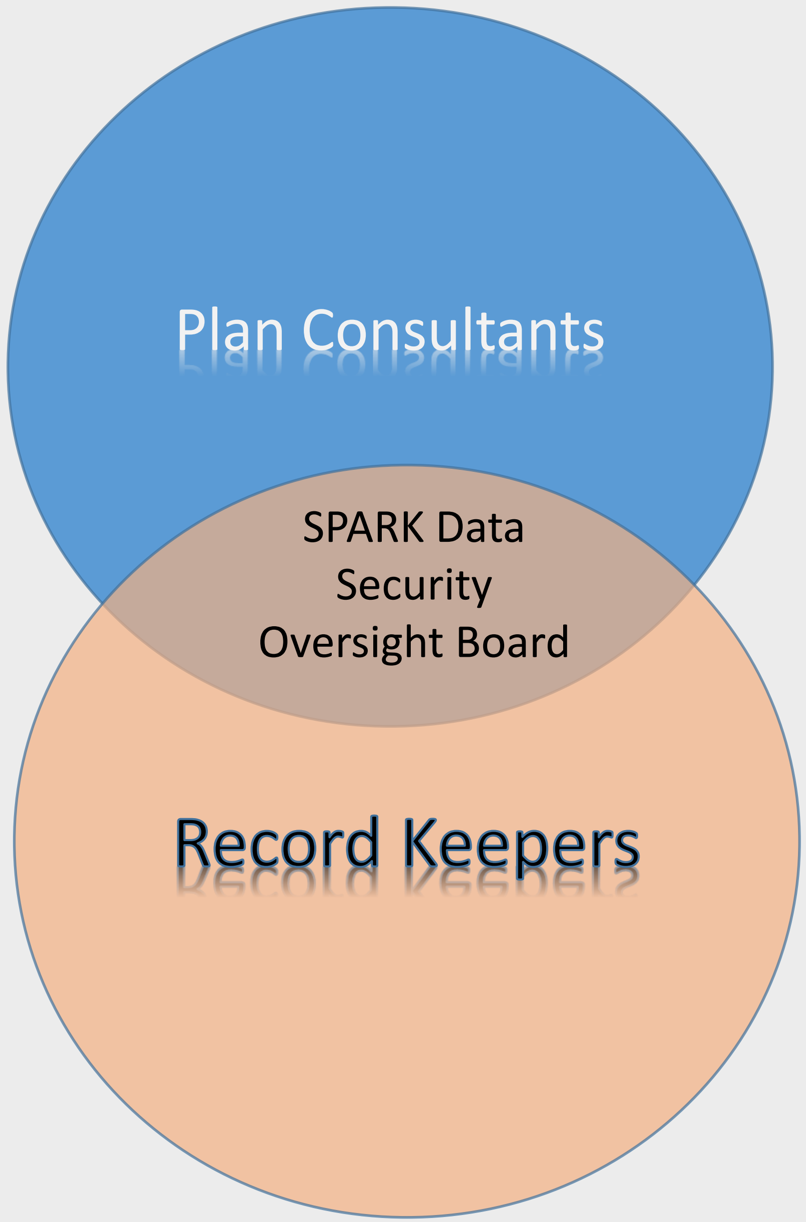


Proliferation of Questions

Intimacy of Questions & Secrecy of Answers

Refusal to Answer to Protect Other Clients

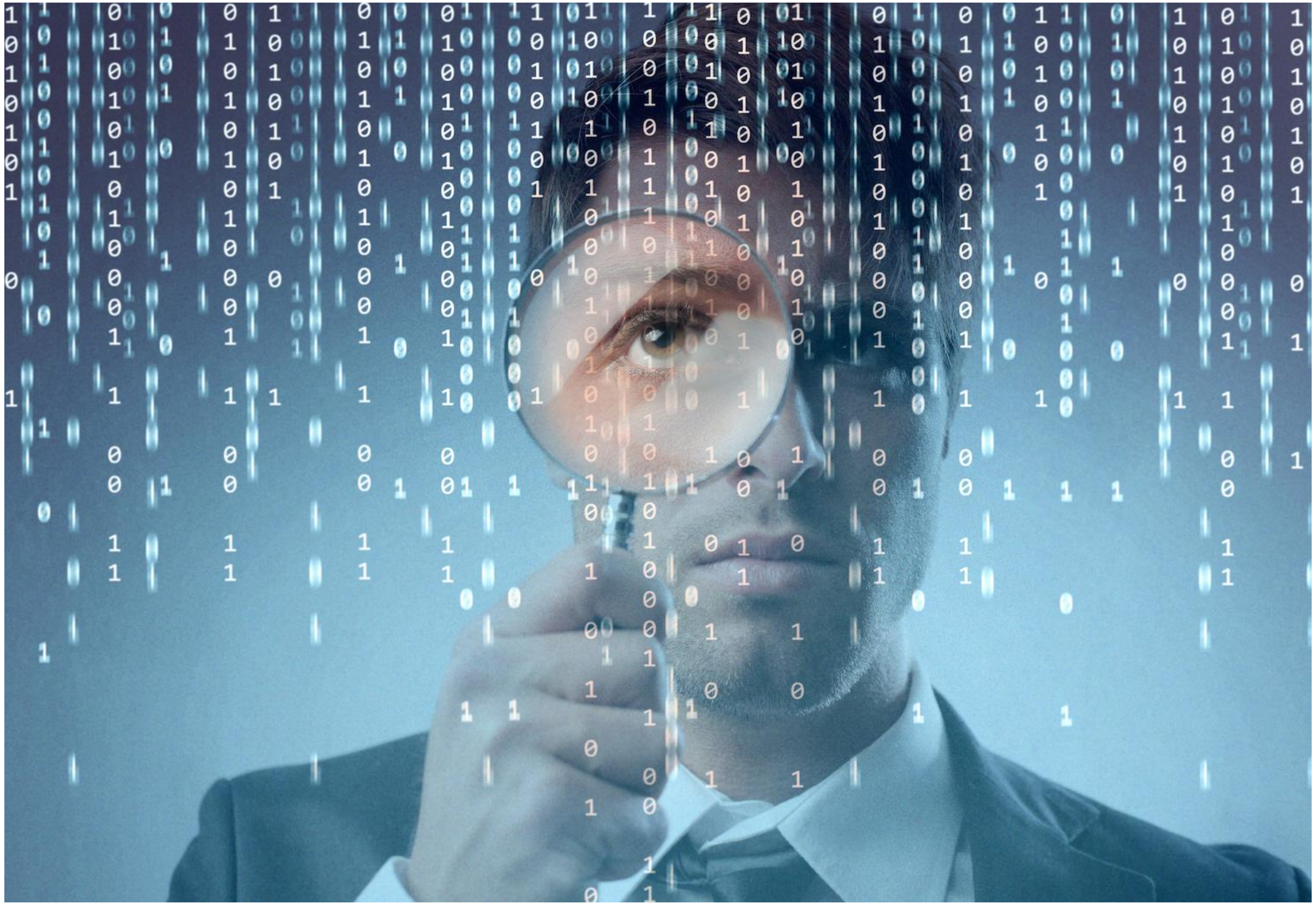
SPARK Data Security Oversight Board



Security Framework Flexibility

- Agreement on a single framework is not possible
- A single framework is NOT Desirable
- Diverse Frameworks make a stronger defense

Third Party Attestations



Flexibility

Easily Understood

Control Objectives

1) Risk Assessment and Treatment

- The organization understands the cybersecurity risk to organizational operations (including mission, functions, image, or reputation), organizational assets, and individuals

2) Security Policy

- Security policies are approved and communicated

3) Organizational Security

- Information security roles & responsibilities are coordinated and aligned with internal roles and external partners

Control Objectives

4) Asset Management

- The data, personnel, devices, systems, and facilities are identified and managed based on importance to business and organization’s risk strategy

5) Human Resource Security

- The organization’s personnel and partners are suitable for the roles they have and are provided cybersecurity awareness education

6) Physical and Environmental Security

- Physical access to assets is managed and protected

Control Objectives

7) Communications & Operations Management

- Technical security solutions are managed to ensure the security and resilience of systems and assets consistent with related policies, procedures, and agreements

8) Access Control

- Access to assets and associated facilities is limited to authorized users, processes, or devices

9) Information Systems Acquisition Development

- A system development life cycle is implemented; a vulnerability management plan is developed and implemented and vulnerability scans are performed

Control Objectives

10) Incident & Event Management

- Response processes and procedures are executed and maintained

11) Business Resiliency

- Response plans for Business Continuity and Recovery are in place

12) Compliance

- Legal requirements regarding cybersecurity, including privacy and civil liberties obligations, are understood and managed

Control Objectives

13) Mobile

- A formal policy is in place and appropriate security measures adopted to protect against the risks of using mobile computing

14) Encryption

- Data-at-rest is protected and Data-in-transit is protected

15) Supplier Risk

- Ensure protection of the organization’s assets that is accessible by suppliers

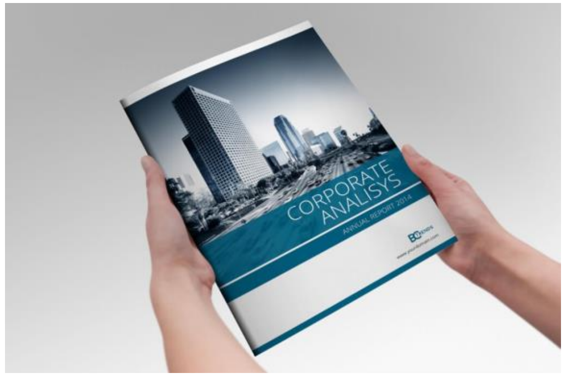
Control Objectives

16) Cloud Security

- Ensure protection of the organization’s assets that are stored or processed in cloud environments

Record Keeper Hires Third Party Independent Auditor

Auditor Uses SPARK's 16 Control Objectives

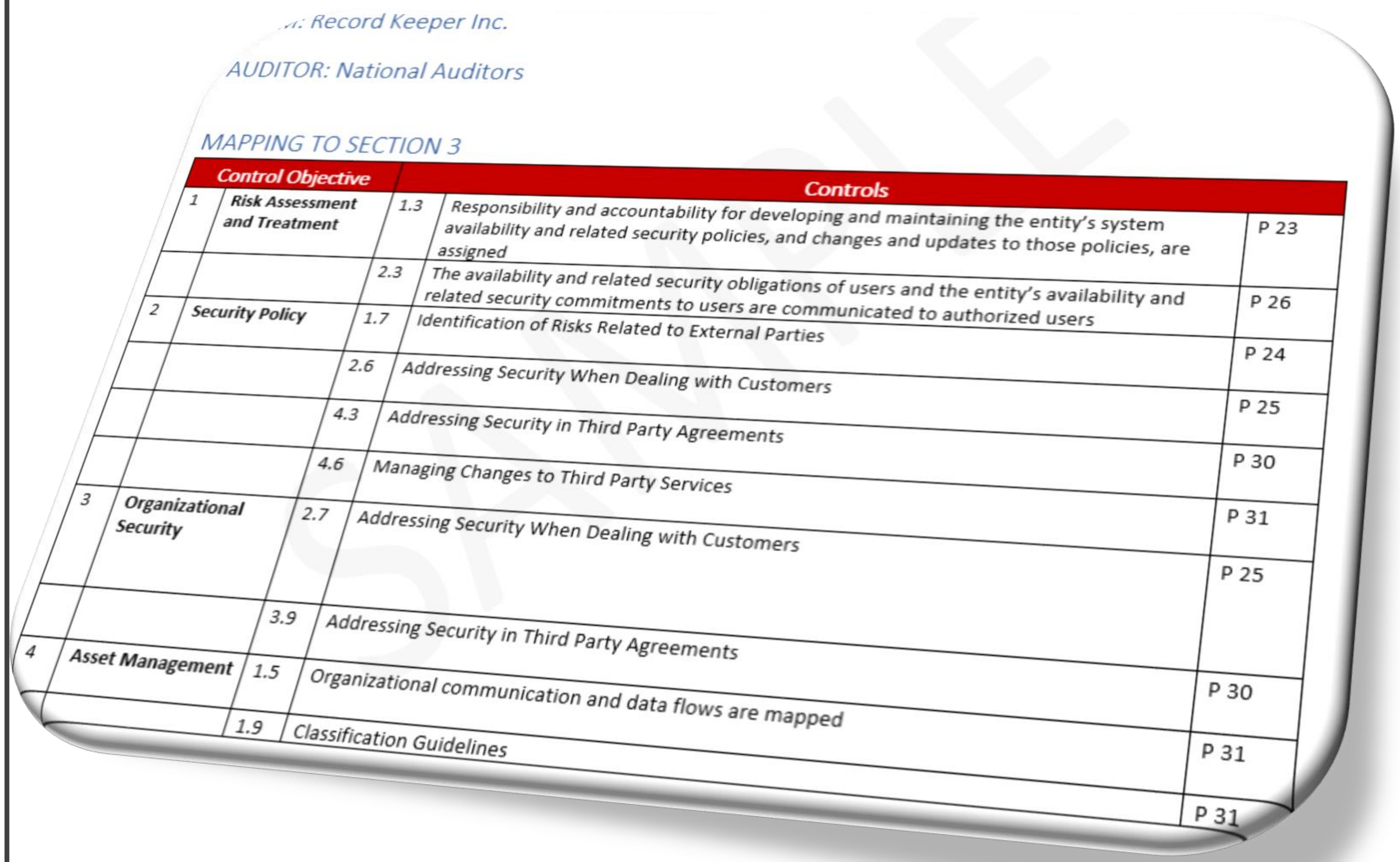


Auditor Creates a SOC2 or AUP Report for Consultants and Plan Sponsors

Plan Consultant or Plan Sponsor Uses Report to Grade Record Keepers

How It Works

Sample of Detailed Audit Report



…: Record Keeper Inc.

AUDITOR: National Auditors

MAPPING TO SECTION 3

Control Objective		Controls		
1	Risk Assessment and Treatment	1.3	Responsibility and accountability for developing and maintaining the entity's system availability and related security policies, and changes and updates to those policies, are assigned	P 23
		2.3	The availability and related security obligations of users and the entity's availability and related security commitments to users are communicated to authorized users	P 26
2	Security Policy	1.7	Identification of Risks Related to External Parties	P 24
		2.6	Addressing Security When Dealing with Customers	P 25
		4.3	Addressing Security in Third Party Agreements	P 30
		4.6	Managing Changes to Third Party Services	P 31
3	Organizational Security	2.7	Addressing Security When Dealing with Customers	P 25
		3.9	Addressing Security in Third Party Agreements	P 30
4	Asset Management	1.5	Organizational communication and data flows are mapped	P 31
		1.9	Classification Guidelines	P 31

Next Steps

Communicate to Plan Sponsors, Consultants and Attorneys

Implement New Best Practice Disclosures for Cyber Security & Data Protection

Share with Retirement Community, Learn and Continually Improve the Process

Penetration Testing Guidlines

The careless distribution of penetration test results is dangerous and opens you up to significant risks

Information	Purpose
Penetration Test Performed	What types of penetration tests were performed (application, network, cloud, other)?
Frequency of Tests	This lets the client know that penetration tests are a regular part of a vendor's cyber security practices
Entity that performed the penetration test	Clients and consultants need to know who is responsible for the penetration testing to validate their expertise
Criticality level of findings	Do you follow CVSS, OCOAS, or other industry standard scoring? If no, please explain. Did your testing identify any material vulnerabilities (critical or high)?
Remediation	Were any findings remediated within your P&P timeframes? What are your remediation timeframes?


FRAUD
PREVENTION

SPARK Fraud Prevention Committee

- Thirteen Industry Recommendations
- Three Work Teams
  1. Plan Sponsor & Participant Education
  2. Information Gathering & Sharing
  3. Industry Best Practices

Questions

MERCER

Pooled Employer Plans:

Who will be ready to take the plunge?

January 2021

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welcome to brighter

MERCER

With regard to Pooled Employer Plans (PEPs), which of these comments most resonates with you?

a. We would consider joining a PEP.
b. Evaluating PEPs is currently not a priority because of time and resource constraints.
c. We prefer to wait and see how the market evolves before exploring a PEP solution.
d. It is highly unlikely that our plan would join a PEP.
e. We are likely to be a first mover to a PEP, and we are exploring PEP options now.
f. Unsure

The US DC marketplace is experiencing profound disruptions

COVID-19 turmoil + **Litigation risk** + **SECURE Act pooled plans**

Areas of focus

- Governance
- Participant/employee engagement
- Participant response monitoring
- Plan design
- Retirement income
- Financial wellness
- Vendor fraud protection

Pooled Employer Plans (PEPs) are reinventing the retirement journey

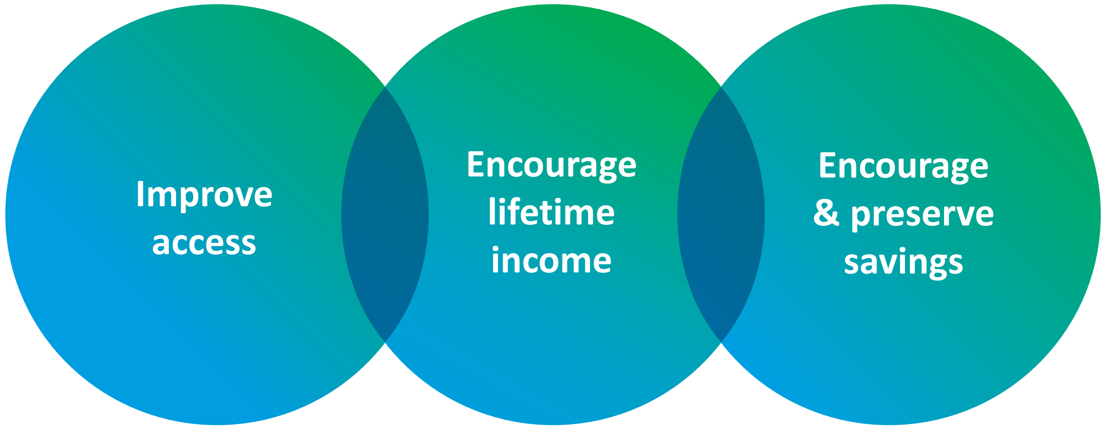
We believe that Pooled Employer Plans (PEPs) can combine the best features of a traditional 401(k) plan with a new, innovative design. With the SECURE Act, employers can now band together into PEPs, allowing for:

- Potentially lower fees for participants
- Potentially lower plan costs for plan sponsors
- Access to a wider range of efficient, diversified investments
- Expanded retirement plan access
- Decreased administrative burden
- Mitigated fiduciary risk

Is a PEP right for you?

The catalyst: The SECURE Act (passed December 2019)

Objectives



While Multiple Employer Plans (MEPs) are not new, the SECURE Act added PEPs, which allow unrelated employers access to pooled plans.

Examples of pooled plans

Already here

Multiple-employer plans (MEPs)

Association retirement plans (ARPs)

Group of plans

Coming in 2021

Pooled employer plans (PEPs)

But PEP regulations are still outstanding

The future of governance
A broader spectrum of potential approaches

Advice

Hire consultant on a project basis
- As needed

Consulting retainer
- Ongoing engagement
- Investment consultant takes on 3(21) fiduciary role

OCIO

Delegated solutions for investments
- Provider takes on 3(38) investment manager role

Expanded outsourcing

"Group of plans"
- Employer continues to be plan sponsor
- "Group of plans" have a similar investment structure
- Provider takes on 3(38) and 3(16)[1] combined
- Typically fully delegated

PEP
- Pooled plan provider (PPP) sponsors the plan
- Participating employers typically have a similar investment structure
- PPP typically takes on 3(38) and 3(16)[1] combined
- Typically fully delegated

[1]This refers not only to a 3(16)'s specific statutory responsibilities but to the broader fiduciary administrative tasks plans typically allocate to the plan administrator

PEPs can benefit employers and participants

How PEPs help employers

Reduce administrative workload; provide an extension of staff

Mitigate fiduciary risk

How PEPs benefit both

Potentially reduce fees

How PEPs help participants

Seek better outcomes

Offer professional oversight and high-quality, market-leading investment options

PEPs at a glance

Traditional 401(k) plans

- Employers sponsor the plan.
- Plan sponsor determines Plan design features and may make changes over time as appropriate
- Employers can choose to manage the plan themselves or outsource investments, plan administration or fiduciary oversight.

Same core benefits

- Help employees save for retirement.
- Employees contribute a percentage of their salary.
- Employers can offer a match.
- Participants have access to a variety of investment options.

PEPs

- Employers join a pooled employer plan (PEP) and no longer sponsor their own plan.
- PEP typically offers a model plan design with limited ability to customize
- A pooled plan provider (PPP) generally assumes administration, management and fiduciary responsibility for the plan.
- Employers retain the responsibility to select and monitor the PEP and PPP.

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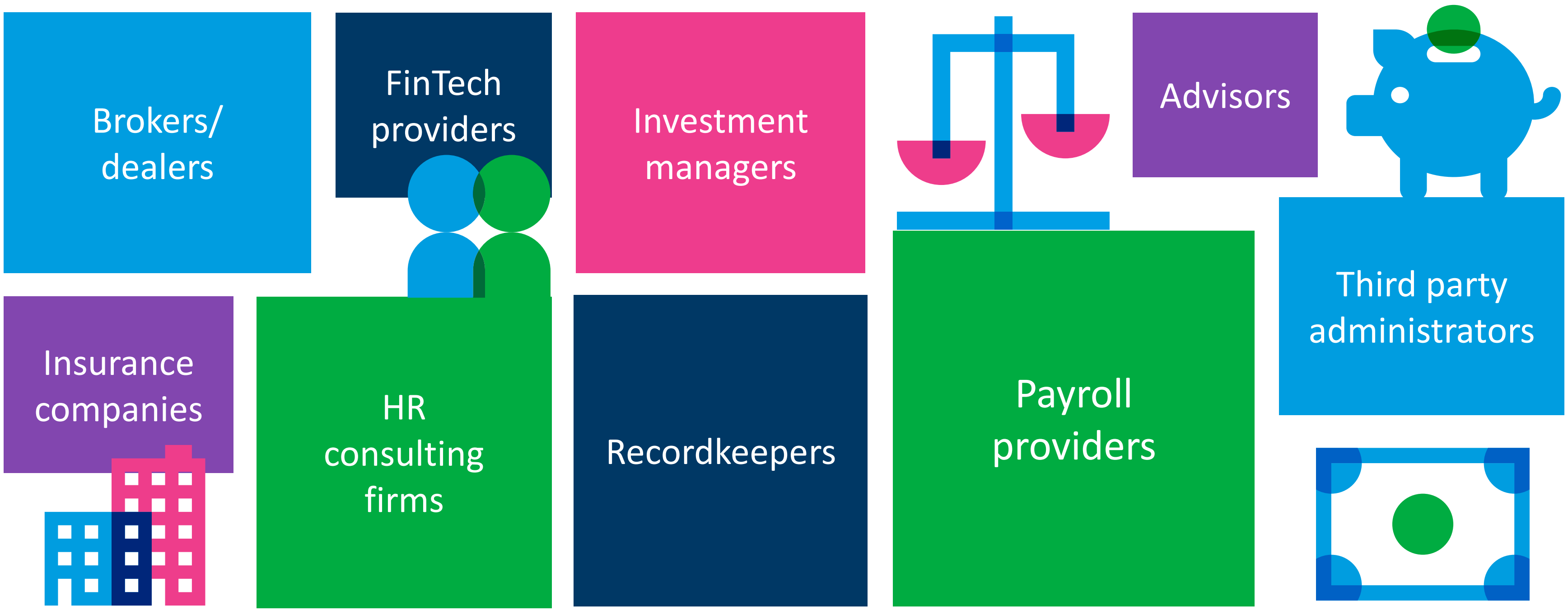
Which benefits of pooled plans do you view as essential? (Choose all that apply)

a. Reduced administrative workload
b. Mitigation of fiduciary risk
c. Lower participant fees
d. A well-diversified investment lineup
e. A great participant experience

Who are likely to become Pooled Plan Providers (PPP)?



Regulations, particularly ERISA's Prohibited Transaction Exemptions (PTEs), influence **how a PEP can be structured and therefore** who can be a PPP.

Who are likely to be early adopters?

Start up to small sized employers

Addressing the coverage gap for those employers not currently offering plans

Small to mid sized employers

Offering economies of scale

Reducing administrative burden

Mitigating fiduciary risk

Large employers

Reducing administrative burden

Mitigating fiduciary risk

MERCER

Looking five years ahead, how do you think PEPs will be positioned in the market?

a. Limited take-up
b. Penetration in smaller market only
c. Penetration in small and larger market
d. Single employer plans are no more

What can we learn from others outside the US?

	Australia	South Africa	UK
Initiation	Accelerated in 1992	1997	2015
Current multiple - employer market adoption*	Almost 100%	40% (excluding unions) & essentially all new plans; more SMEs than LM	40% of existing plans, moving towards 50%; 90%+ of new business

- Cost shifting from employer to employee was key driver of change in UK and Australia
- Increased regulatory burden was another driver

Why might the US experience differ?

*Source: Retirement Reinvented Webinar June 2020

Forthcoming guidance?

- Model plan language
- Required administrative duties of the PPP
- Prohibited transaction exemptions
- Conflicts of interest

What's driving increasing interest in outsourcing (and PEPs)?

Top five issues

1. Challenging environment that requires plan sponsors to do more with less resources
2. Desire to offload fiduciary risk and administrative responsibilities to a third party
3. Interest in having access to higher quality investment options
4. Pressure to lower fees and costs—for both company and participants
5. Desire to free up time to focus on benefits strategy

PEPs may be the answer

- Nearly 50% of plan sponsors surveyed indicated that they are spending less time than they would like to on their retirement plans.[1]
- Cerulli predicts "continued strong growth in the OCIO industry." [2]

[1] Two Mercer surveys of approximately 200 retirement professionals conducted in June 2020 and August 2020
[2] PGIM, "Part I The Evolving Defined Contribution Landscape : The Expanding Role of OCIOs", October 2020

Is a PEP right for you?

- How will my **participants benefit**?
- Are there any **conflicts**?
- Can I keep my current **plan design**?
- Will PEPs **save me time**?
- How are PEPs **innovative**?
- Will PEPs really **save money**?
- Will we have any input on **investment options**?
- Can we still offer **company stock**?
- **What size** plans will likely move to PEPs?
- Do PEPs eliminate my **fiduciary responsibility**?
- Will PEPs improve **inclusion**?

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Having listened to this session:
With regard to Pooled Employer Plans (PEPs), which of these comments most resonates with you?

a. We would consider joining a PEP.
b. Evaluating PEPs is currently not a priority because of time and resource constraints.
c. We prefer to wait and see how the market evolves before exploring a PEP solution.
d. It is highly unlikely that our plan would join a PEP.
e. We are likely to be a first mover to a PEP, and we are exploring PEP options now.
f. Unsure

Appendix

Liana Magner, CFA

Liana Magner is a Partner in Mercer's Boston, MA office and serves as the Defined Contribution Leader in the US.

Liana has overall responsibility for strategy, development, management and growth of our defined contribution and financial wellness business within the US. Liana continues to be responsible, since 2013, for the ongoing development of Mercer's DC Outsourced CIO unit on a national basis. Her client responsibilities include working with our largest defined contribution plans on both an advisory and delegated basis.

Liana has over 20 years of investment consulting experience, with a specialty in consulting to large DC plan sponsors. Additionally, Liana is a member of our Wealth Leadership Team, Target Date Fund Strategic Research Team, our DC Discretionary Governance Committee, and our National Defined Contribution Investment Committee. Previously, she served on the manager research ratings review committee for nearly ten years.

Prior to joining Mercer in 1998, Liana worked in the investment management industry as a marketing analyst at Quadra Capital Partners, and previously in operations at Boston Investor Services.

Liana has a BA, cum laude, in economics from the University of New Hampshire. She is a CFA® charterholder and a member of the CFA Institute and the Boston Society of Security Analysts.

Liana Magner, CFA
US Defined Contribution Leader

20+ years
of investment experience

Preston Traverse

Preston Traverse is currently a Partner in the Defined Contribution Segment since September 2018. Prior to this position, he was Chief Operating Officer for the DC & Financial Wellness group within Mercer Investment Management since March of 2016. The DC & Financial group focusses on defined contribution and financial wellness advice and solutions for companies within the United States.

Prior to joining Mercer, Preston was Global Head of Marketing and Product Management. He had overseen product management and development since The Boston Company in 2006. In addition, he assumed oversight of the Marketing/E-Business group and the Communications, Media and RFP team in 2013. Preston also was chair of the Product Committee, which determined overall product strategy as well as specific product capabilities.

Prior to joining The Boston Company, Preston held product management and development positions at Mellon Asset Management, where he worked from 2004 to 2006, and Fleet Bank/Bank of America, where he worked from 1998 to 2004. In these roles, he was responsible for the development of legal structures and delivery vehicles for investment management capabilities; the creation, design and implementation of new products; and the launch of collective funds, hedge funds and mutual funds. Previously, he worked as a Client Service Manager at Boston Financial Data Services from 1996 to 1998 and as a Mutual Fund Representative at Scudder, Stevens & Clark, Inc., from 1992 to 1994.

Preston received a BA in History from Denison University and an MBA from Boston University.

Preston Traverse
Mid-Market DC Solutions Leader

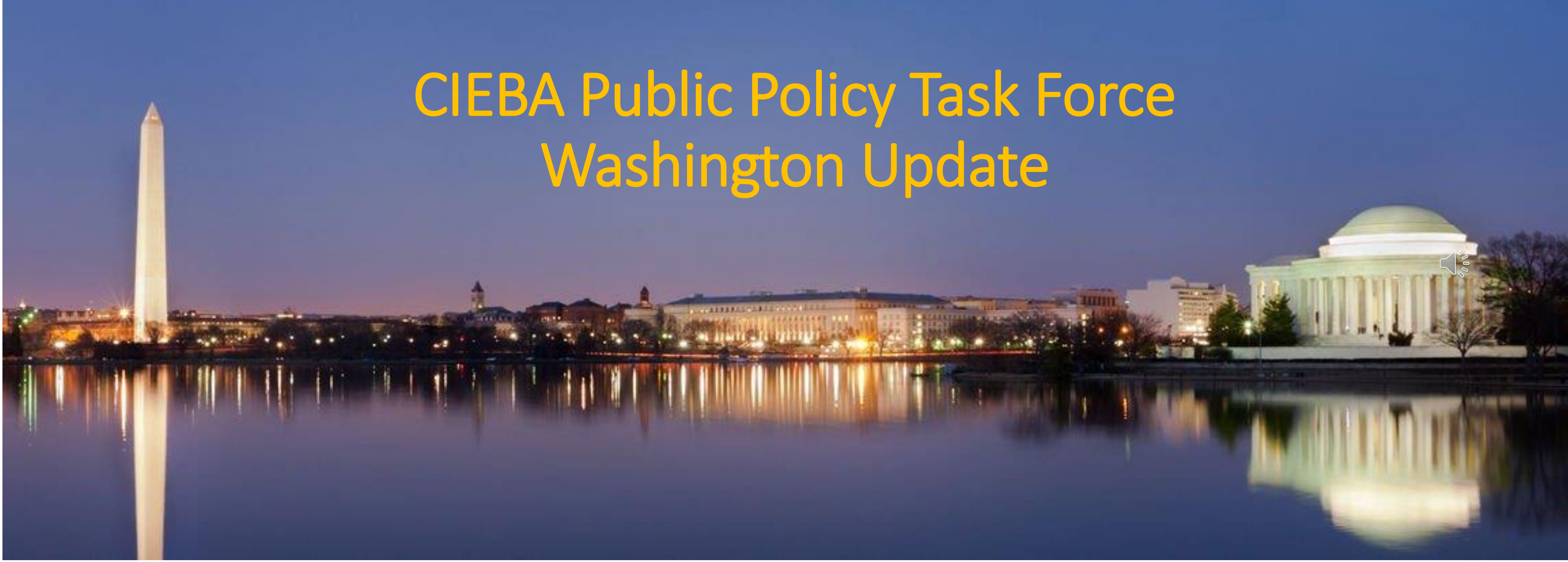
20+ years
of investment experience

Important notices

MERCER

welcome to brighter

CIEBA Public Policy Task Force
Washington Update



Dennis Simmons, Executive Director—CIEBA

Michael Kreps, Principal—Groom Law Group

January 13, 2021

CIEBA
Committee on Investment of
Employee Benefit Assets Inc.

CIEBA Public Policy Washington Update

- Michael Kreps, Principal, Groom Law Group
- Dennis Simmons, Executive Director, CIEBA

CIEBA Bumper Music Trivia – Submit through Q&A Icon

Answer all three:

1. **Name the recording studio** where "Come Together" was originally recorded.
   - hint: it's the same name as the album on which song was released.
2. Original title: "Come Together, Let's Party" – John Lennon's first version of song was for the failed campaign of an LSD-advocating CA Gubernatorial Candidate in 1969. **Name him**.
   - hint: he was never married to Linda Ronstadt; and
3. **What commercial product is referenced in the song**, which caused the BBC to originally ban it as advertising?

AGENDA

- **Legislative Update**
  - Multiemployer pensions
  - Funding Stabilization
  - SECURE Act 2.0
- **Regulatory Update**
  - Biden Administration priorities
  - Fiduciary rule
  - Financial factors rule
  - Proxy voting rule
  - Missing participants guidance – BREAKING NEWS ALERT

CIEBA
Committee on Investment of Employee Benefit Assets Inc.

Democratic Majorities in Congress

- **50/50 Senate**
  - 60 votes required to break Senate filibuster
- **Reconciliation**
  - Budget-related process
  - Allows passage with simple majority
  - Limitations on substance, process
- **Congressional Review Act**
  - Used to overturn rules
  - Unlikely to be used because it limits future rulemaking

Multiemployer Pensions

- **Insolvency crisis**
  - Plans and PBGC
- **Last Congress (116th)**
  - Butch Lewis Act, HEROES Act, Grassley/Alexander
  - Lawmakers failed to reach agreement
- **This Congress (117th)**
  - Reconciliation?

Funding Stabilization

- Last Congress (116th)
  - 2020 contribution delay
  - Partial termination relief
- Legislative Proposal
  - Narrowed, extended rate corridor
  - 15-year amortization period

CIEBA
The Committee on Investment of Employee Benefit Assets

April 24, 2020

Speaker Nancy Pelosi
U.S. House of Representatives
1236 Longworth H.O.B.
Washington, DC 20515

Majority Leader Mitch McConnell
U.S. Senate
317 Russell Senate Office Building
Washington, DC 20510

Minority Leader Kevin McCarthy
U.S. House of Representatives
2468 Rayburn House Office Building
Washington, DC 20515

Minority Leader Charles Schumer
U.S. Senate
322 Hart Senate Office Building
Washington, DC 20510

Dear Congressional Leadership:

I write on behalf of the Committee on Investment of Employee Benefit Assets (CIEBA) to ask you to protect American workers' jobs and pension benefits by extending the single-employer pension

a) . . .We support **reducing the 10% interest rate corridor to 5% effective in 2020** . . . ;

b) . . . we think **an effective, workable floor would be 5%,** to offset the impact on pensions of federal actions taken over the past decade to keep interest rates low; and

c) . . . (*e.g.*, **a 15-year amortization period**).

investments has fallen dramatically. The result is that minimum required pension contributions are set to increase dramatically just at the time that the pandemic has caused corporate revenues to fall precipitously.

In this regard, the PBGC explained in its 2019 Annual Report[1] that the single-employer program had been showing continuous improvement and was in a financial surplus. In our view, this improvement was due in significant part to the stabilization that Congress very effectively extended in the Moving Ahead for Progress in the 21st Century Act (MAP-21) that grew out of the 2008 Great Recession, and we are essentially asking Congress to follow its own lead with effective actions again today.

Therefore, CIEBA urges Congress to respond again effectively, as it has done in the past, to:

a) **Extend and improve the current funding stabilization rules to provide more consistent and reasonable minimum required pension contribution**. We support reducing the 10% interest rate corridor to 5% effective in 2020. Next, a phase-out of the 5% corridor should be delayed until 2026, at which point the corridor could, as under current law, increase by five percentage points each year until the corridor reaches 30% in 2030, where it would thereafter remain;

b) **Create a floor on funding interest rate assumptions**, and we think an effective, workable floor would be 5%, to offset the impact on pensions of federal actions taken over the past decade to keep interest rates low; and

c) **Allow plan sponsors to fund their pensions over the course of more than one business cycle** (*e.g.*, a 15-year amortization period).

Again, these policies are important to preserving pension plans and jobs. And they are also protective of the federal pension insurance program – run by the PBGC – which will be negatively impacted if employers are forced into bankruptcy, freezes or dramatic cut-backs due to a dramatic spike in pension funding obligations.

We appreciate your attention to this issue and your commitment to helping Americans retire with dignity and financial independence. Please do not hesitate to contact me if we here at CIEBA can be of any additional help on this important issue.

Sincerely,

Dennis Simmons
Executive Director

cc: Chairman and Ranking Member of the House Ways & Means Committee
Chairman and Ranking Member of the House Education & Labor Committee
Chairman and Ranking Member of the Senate Finance Committee
Chairman and Ranking Member of the Senate HELP Committee
Secretary of Labor Eugene Scalia
Secretary of the Treasury Steven Mnuchin
PBGC Director Gordon Hartogensis

Funding Stabilization

- Last Congress (116th)
  - 2020 contribution delay
  - Partial termination relief
- Legislative Proposal
  - Narrowed, extended rate corridor
  - 15-year amortization period
- Challenges
  - Difficult to do through reconciliation
  - Likely tied to multiemployer relief

Funding Stabilization – Polling Question

SECURE Act 2.0

- **New automatic enrollment safe harbor (at 6%)**
- **Catch-up contributions increased from $6,500k to $10k**
- **Student loan payment matching contributions**
- **Refundable savers credit**
- **RMD age increased to 75 in 2030**
- **403(b) investment in Collective Investment Trusts**

Regulatory Outlook – Biden Administration Priorities

- Few retirement priorities
  - Mostly focused on health
- Campaign proposals
  - Expanding Social Security
  - “Equalizing” tax incentives
  - Holding financial professionals to a fiduciary standard
- Future for recent Executive Orders
  - EO blacklisting investment in certain Chinese companies
- Enforcement changes?

CIEBA
Committee on Investment of Employee Benefit Assets Inc.

Regulatory Items

- **DOL Fiduciary Rule and Exemption**
  - CIEBA DOL Testimony (Sept. 3, 2020)
  - Final but <u>not</u> effective
- **Financial Factors (ESG) Rule**
  - Final and effective
  - ESG investigations
- **Proxy Voting Rule**
  - Final and effective
- **Missing Participant Guidance (Jan. 12, 2021)**
  - Best practices and enforcement guidance on terminated vested participants

Eye on the Market Outlook 2021

The Hazmat Recovery. In response to the worst pandemic in 50 years and a country at war with itself over lockdowns, individual freedoms and election results, the Fed and Congress airdropped an unprecedented amount of stimulus with vaccine airdrops to follow. That should be enough for markets to rise again in 2021 as pent-up activity is unleashed, and since the bill for stimulus is shifted to future generations. Whether this solves any of the other issues is a different story. Our 2021 Outlook reviews these topics along with deep dives on China, Europe, Emerging Markets, tech antitrust issues, gold and the rapidly shrinking portfolio choices for yield-oriented investors.

J.P.Morgan

MARY CALLAHAN ERDOES
Chief Executive Officer
J.P. Morgan Asset & Wealth Management

2020 was a year unlike any other—unprecedented in history. Let's try not to repeat it.

Amid all the confusion, my partner and Chief Investment Strategist for J.P. Morgan Asset & Wealth Management, Michael Cembalest, helped us to find the signals through the noise.

I remember how crazy it sounded, on our first virus webcast in March, when Michael told us that he thought the world would be 70–80% back to normal by March 2021. Well, he may be spot on. Let's hope for continued progress as the recovery continues. Michael's outlook will help us to think about our own portfolio positioning as we head into this new year.

After the year we just had, I want to especially thank each one of you for the trust and confidence you place in all of us at J.P. Morgan.

Happy New Year,

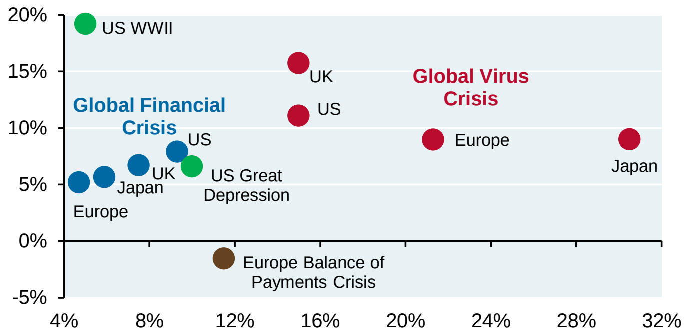
Mary C. Erdoes

2021 Outlook: The Hazmat Recovery **January 1, 2021**

Executive Summary

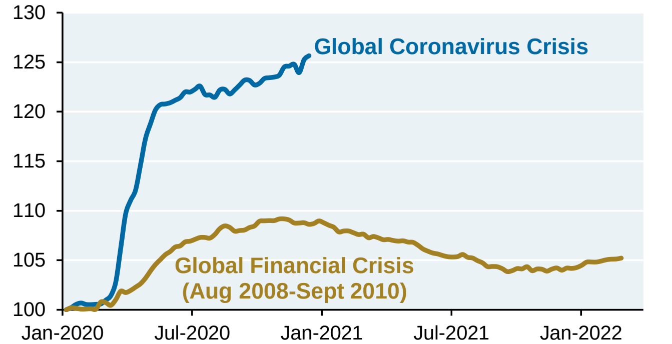
While 2020 is defined by some as the year of COVID and by others as the year of the most hotly disputed US election in decades, for investors it was the year of mega-stimulus. The developed world response to the coronavirus involves monetary and fiscal stimulus that dwarfs anything seen before it, that was delivered much faster, and which influences our investment outlook for 2021 and beyond.

Stimulus response to COVID sets a new bar
Fiscal stimulus, % of GDP



Monetary stimulus (Central Bank balance sheets), % of GDP
Source: Central bank sources, OMB, St Louis Fed, JPM Global Economic Research, JPMAM. December 2020.

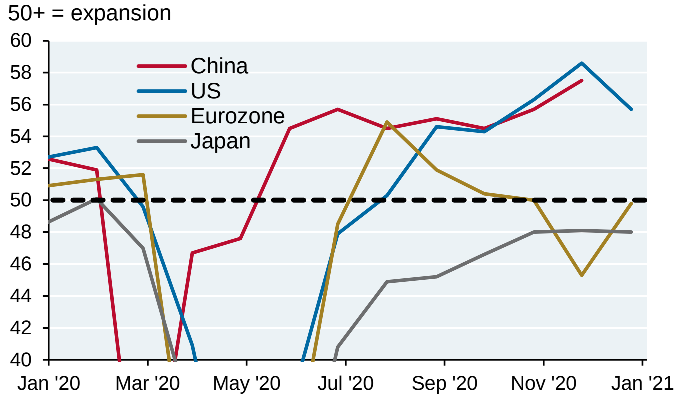
Faster growth in the money supply this time around
M2 money supply + institutional money market fund balances, index



Source: St Louis Fed, J.P. Morgan Asset Management. December 14, 2020.

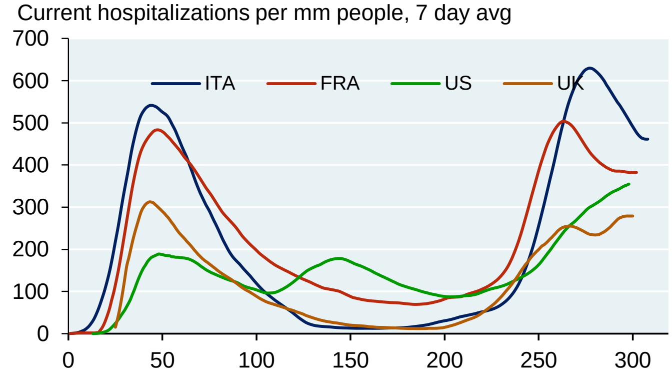
COVID has surged in the developed world, and vaccination of vulnerable populations may not permanently mitigate hospitalization and mortality until April or May[1]. The first chart on the next page shows the US spending stall that hit when the fall COVID wave began. Even so, by late summer of 2021 we expect the global economy to be close to pre-COVID levels of activity given vaccination timelines. China is already booming again, and signals from the copper market point to stronger global growth in 2021.

Regional manufacturing & services business surveys
50+ = expansion



Source: Markit PMI. December 2020. December data is preliminary.

COVID Hospitalizations
Current hospitalizations per mm people, 7 day avg



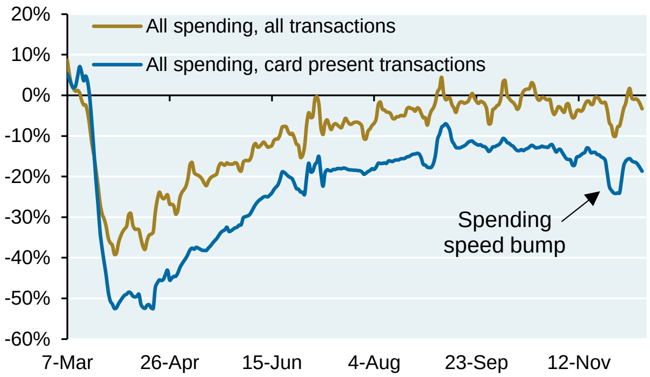
# of days after total reported cases reaches 100
Source: COVID Tracking, ECDC, IMF, JPMAM. December 27, 2020.

[1] **Vaccinations**. The US Advisory Committee on Immunization Practices has prioritized healthcare/nursing home workers and long term care residents in **Phase 1a**. Given projected vaccine production schedules, most US healthcare workers could be immunized by the end of January. **Phase 1b** targets essential workers (teachers, agriculture, police and fire) and people over age 75. **Phase 1c** targets those aged 65-74 and people with high risk medical conditions. **Phases 1a-1c could be completed by June**.

More broadly, developed countries are projected to have vaccine capacity of 1.5x-2.0x their vulnerable populations (people > 60, medical workers and those with severe co-morbidities) by Q2 2021, and 0.5x to 0.7x their total populations by the same date. See Section 3 on our COVID web portal for more information.

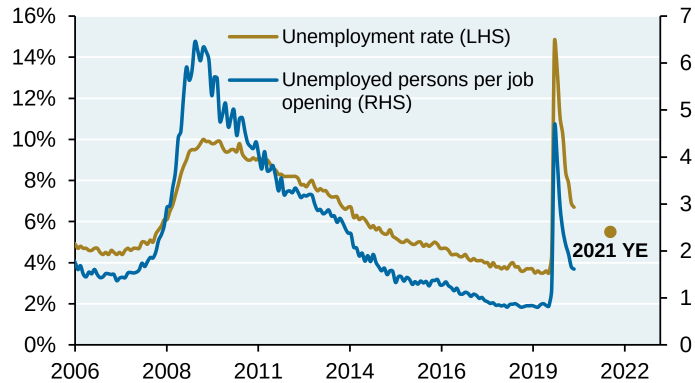
Pandemic shocks are different from traditional recessions. Pandemics and natural disaster cycles are generally faster: see employment, production, consumer spending and capital spending examples below. As the global and US recoveries continue in 2021, we expect US unemployment to end 2021 at around 5%. The third chart highlights the very different impact of pandemic lockdowns on labor markets: **while unemployed individuals surged in 2020, the number of job seekers per job opening did not** (i.e., most expect to get their jobs back).

National credit and debit card spending trends
Spending change 2020 vs 2019, 7 day smoothing



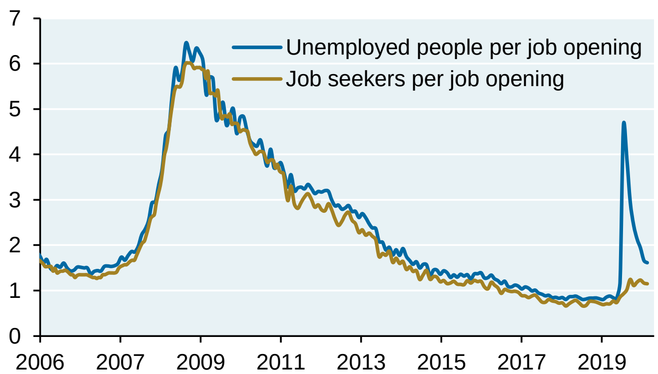
Source: Internal Chase data, JPMAM. December 13, 2020.

Unemployment and job openings
Percent



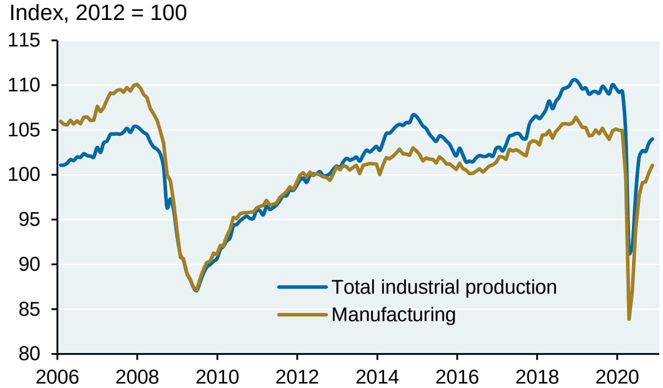
Source: BLS, JPMAM. November 2020.

The key labor market difference, 2009 vs 2020
Ratio



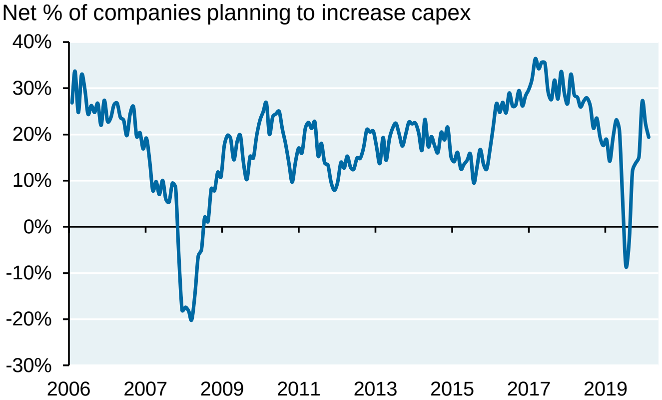
Source: BLS, GS. November 2020.

US industrial production
Index, 2012 = 100



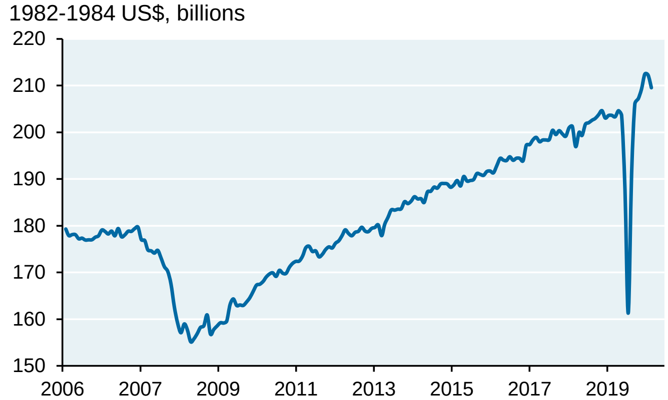
Source: Federal Reserve Board. November 2020.

Capital spending expectations
Net % of companies planning to increase capex



Source: Federal Reserve Bank, JPMAM. November 2020.

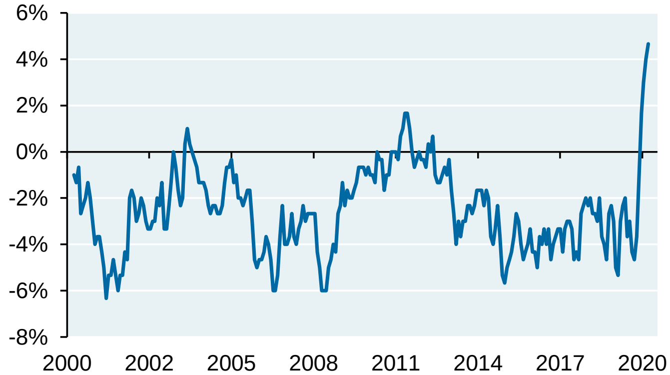
Real retail sales
1982-1984 US$, billions



Source: BLS. November 2020.

Tight inventory conditions should help growth by mid-year given the need for hiring and capital spending to meet demand; elevated supplier delivery delays also confirm this general trend. Note that despite business closures due to COVID, there was a spike in new business applications across a wide range of industries.

Business inventory tightening
% businesses reporting inventories too low - too high, 3-month avg



Source: National Federation of Independent Business. November 2020.

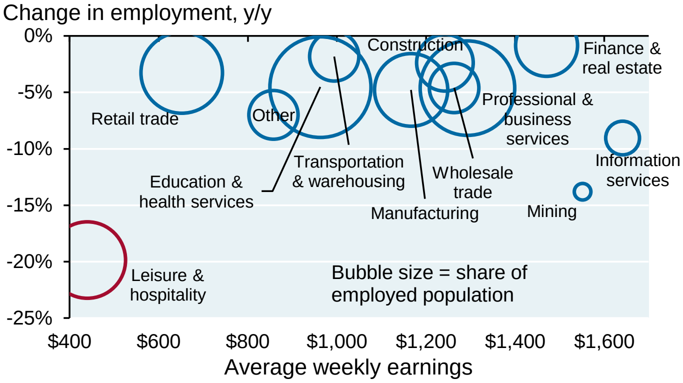
New business applications filed with the IRS in 2020
% of 2019 level, weekly data

Source: US Census Bureau. December 19, 2020.

To be clear, there has been a catastrophic employment decline in COVID-affected sectors. To get a sense for how bad leisure & hospitality job losses are, consider this: the *peak* decline in employment in the last few recessions was 4%-6%; and that's how much employment is still down in the *better-positioned* sectors of the US economy. So, the current 20% decline in leisure & hospitality employment is catastrophic.

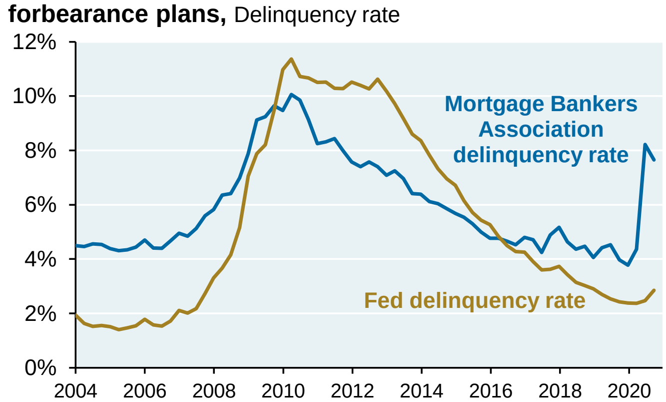
However, fiscal stimulus allowed spending for the lowest income cohorts to recover to pre-COVID levels by June of last year. See the first 2 charts on the next page; you can see the impact of stimulus bills on spending of unemployed families. How are households doing on mortgage payments? The truth lies in between the Fed delinquency measure (assumes that people on forbearance will be current when plans end) and the MBA measure (assumes that people on forbearance are in default). Since unpaid balances will be shifted to balloon payments at the end of the mortgage, I believe the "right" measure is closer to the lower Fed estimate.

Change in private sector employment vs average weekly earnings by industry
Change in employment, y/y



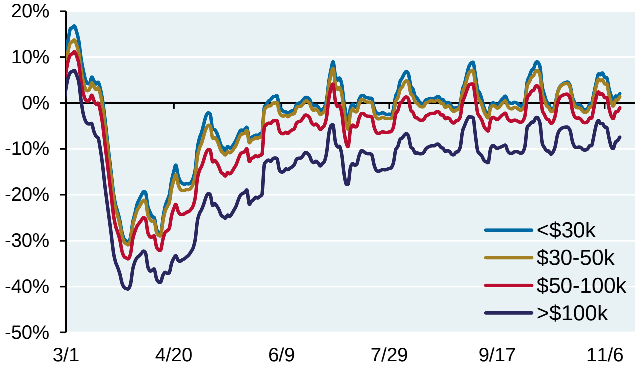
Source: BLS. November 2020.

Mortgage delinquency rates depend on treatment of forbearance plans, Delinquency rate



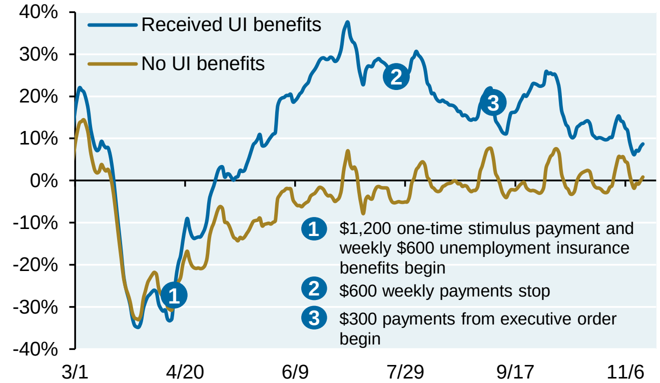
Source: Bloomberg. Q3 2020.

National spending trends by income
% change from January 2020 level, 7-day average



Source: Internal Chase data, JPMAM. November 13, 2020.

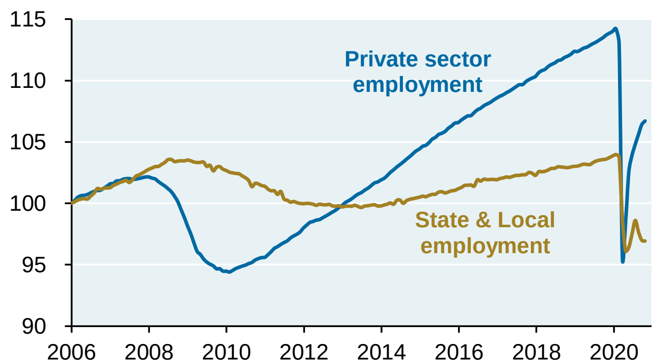
National spending trends based on unemployment benefits, % change from January 2020 level, 7-day average



Source: Internal Chase data, JPMAM. November 14, 2020.

One last comment on employment: US state & local governments suffered large revenue shortfalls due to lockdowns. They are likely to be a drag on growth in the years ahead, as they were a decade ago after the Global Financial Crisis. The state/local fiscal gap (net of CARES Act funding) is ~$170 bn; smaller than the originally projected $250 bn gap, but still significant. Possible spending cuts: municipal employment levels (which are 10-12% of total US employment), and contributions to pension and retiree healthcare plans which are already underfunded. We will take a look on a state by state basis later in 2021.

State & Local employment: drag on future growth
Index, Jan 2006 = 100

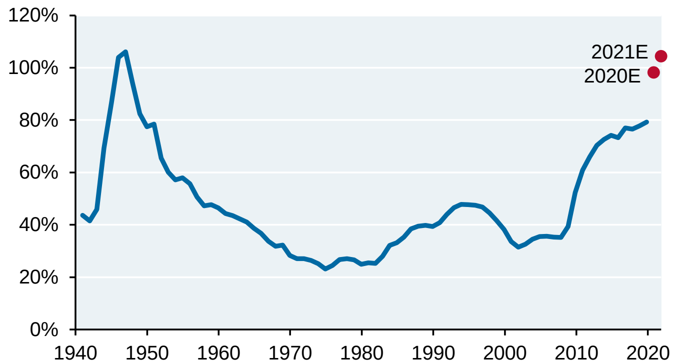


Source: Federal Reserve. November 2020.

The Federal Debt Explosion

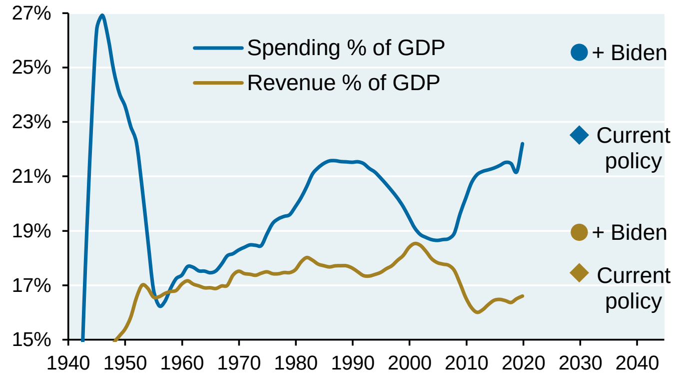
US debt levels are projected to hit WWII peaks by the end of 2021. The projected 2020 US fiscal deficit is 16% of GDP, the largest deficit since 1945. In July 2020, the CBO projected the 2021 deficit at 8.6% (between 1946 and 2019, the deficit was only larger twice). Updated deficit forecasts for 2021 require assumptions on growth, the latest stimulus bill and the interplay between the two; our sense is that the deficit will exceed 10% of GDP in 2021. On top of such deficits, **Biden's tax and spending proposals entail another $3 trillion in taxes and another $8 trillion in spending over the next decade**, which would drive the US federal debt to even higher levels. See the second chart, and p.33 for more on what looks like a permanent increase in the US federal debt. These increases are of course contingent on political developments we discuss on the next page.

Gross federal debt held by the public
% of US GDP



Source: Congressional Budget Office. September 2020.

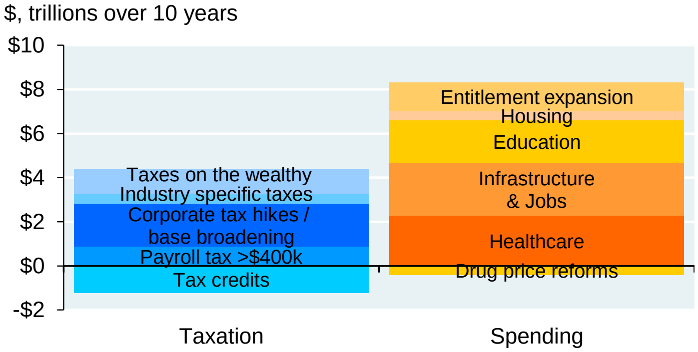
Biden agenda would propel tax revenues and gov't spending to post-war highs, % of GDP, trailing 10 years



Source: OMB, CBO, Cornerstone Macro Research, JPMAM. September 2020.

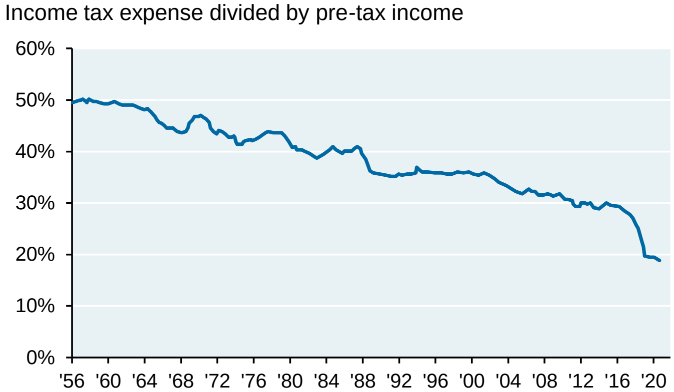
One of the most important components of Biden's plans for investors: changes to corporate taxation. Investors pay close attention to corporate taxation; its decline since the 1980's has been a key driver of expanding S&P 500 profit margins. Biden's agenda doesn't just increase corporate tax *rates*; the plan also includes base broadening and a wide range of industry-specific taxes. **In aggregate, Biden's corporate tax plans would raise $2.2 trillion compared to corporate tax cuts of $740 billion provided by Trump's 2017 bill**. In terms of its impact on profits, Biden's plan could reduce S&P 500 EPS by ~10%, but that's before incorporating any growth benefits from increased government spending (i.e., multiplier effects).

Biden Agenda: $3 trillion in taxes, $8 trillion in spending
$, trillions over 10 years



Source: Cornerstone, Tax Policy Center, Tax Foundation, U. Pennsylvania, JPMAM. October 2020. Tax credits: for homebuyers, renters, caregivers, IRA savers and reshoring manufacturers.

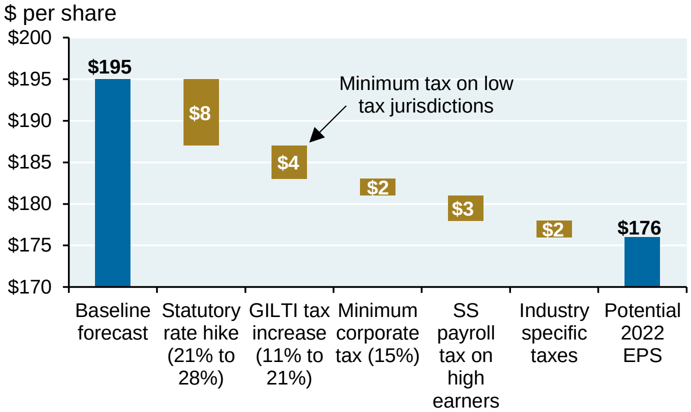
Large cap stocks median effective tax rate
Income tax expense divided by pre-tax income



Source: Empirical Research. October 2020.

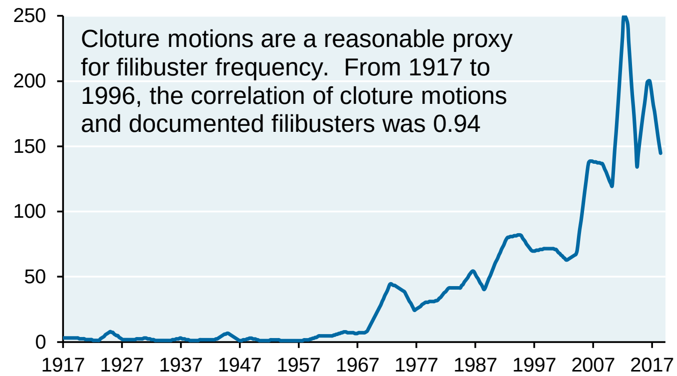
Biden's agenda is dependent on the outcome of Georgia Senate runoff elections. If Democrats win both seats, they could enact tax/spending changes with a 51-50 Senate majority using budget reconciliation rules[2], and enact other major policy changes by jettisoning the Senate filibuster (which if retained, requires 60 votes in the Senate to pass most legislation). However, even if Democrats attain 50 seats in the Senate, they may find it difficult to (a) use budget reconciliation to pass Biden's tax and spending proposals with very narrow Senate and House majorities, and to (b) jettison the Senate filibuster which has been used frequently in recent years by both parties to block legislation. Filibuster supporters reportedly include Joe Manchin (D-WV), who is ideologically closer to moderate Republicans than he is to progressive Democrats.

Biden tax plan impact on 2022 EPS estimate
$ per share



Source: GS, JPMAM. December 2020.

A proxy for filibuster frequency
Number of cloture motions filed, 65th Congress - 116th Congress



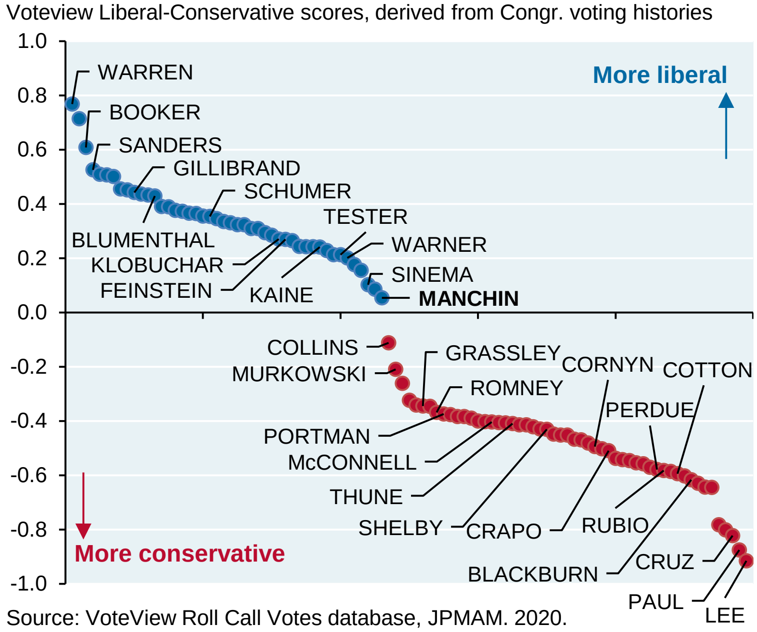
Source: Brookings Institution, Washington Post. 2020.

Cornerstone Research has laid out policy avenues for Biden with and without Senate control, some of which we illustrate below. In addition, we go into detail on antitrust later in the Executive Summary and on pages 25-28; we discuss tariff and trade policy on pages 15-17; we expect a rejuvenated Consumer Finance Protection Bureau once new leadership is confirmed; we expect Net Neutrality to be reinstated; and expect Biden to expand DACA, refocus ICE on violent offenders, increase immigration agency staffing and increase refugee limits.

	Biden & GOP Senate Control	Biden & DEM Senate Control
Taxation	No tax hikes; extension of some expiring TCJA provisions for companies and the middle class	Individual tax hikes within 10 yr window but no changes to payroll tax; less change to cap gains/dividends; some corp. tax hikes; no TCJA extensions
Healthcare	Stabilize ACA (state Medicaid expansion); drug price controls possible	Expand ACA; limited chances for a Public Option, no M4A; drug price controls likely
Fossil fuels	Limit drilling and methane emissions; rejoin Paris accord; stricter fuel emissions standards	Energy tax hikes plus all measures mentioned in the Biden/GOP control column
Green energy	Expand EV and renewable energy credits	More subsidies for renewable production, transmission, transportation
Infrastruct.	Smaller deal focused on surface transportation, possibly tied to new fuel taxes	Larger deal ($1 trillion) via budget recon; surface infrastr + schools/housing

Source: Cornerstone Research. December 29, 2020.

2020 Senate polarization scores
Voteview Liberal-Conservative scores, derived from Congr. voting histories



Source: VoteView Roll Call Votes database, JPMAM. 2020.

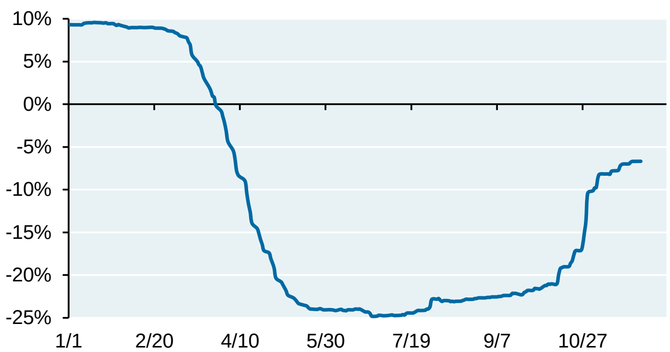
[2] **Budget reconciliation** allows tax and spending changes **if** there is no change to the deficit after a ten year time frame (this clause is why some Trump tax cut provisions sunset within 10 years). Also, no changes are allowed to payroll or social security taxes, which are a big component of the Biden plan ($870 bn out of $3 trillion in new taxes). Finally, tax and spending changes must be "incidental" to regulatory policy and not contingent on them.

Markets: earnings set to rebound, but a lot of good news is already priced in

Earnings resilience. In Q3 2020, S&P 500 earnings handily beat expectations (-8% vs consensus -25%), and the details are important: airlines, other travel-related businesses and energy accounted for essentially the entire S&P 500 earnings contraction in the quarter. Free cash flow for the core of the equity market (excluding financials, REITs and energy) was actually *up* in Q1, Q2 and Q3 of 2020. At the current pace of improvement, S&P 500 EPS should exceed pre-pandemic levels by the end of 2021.

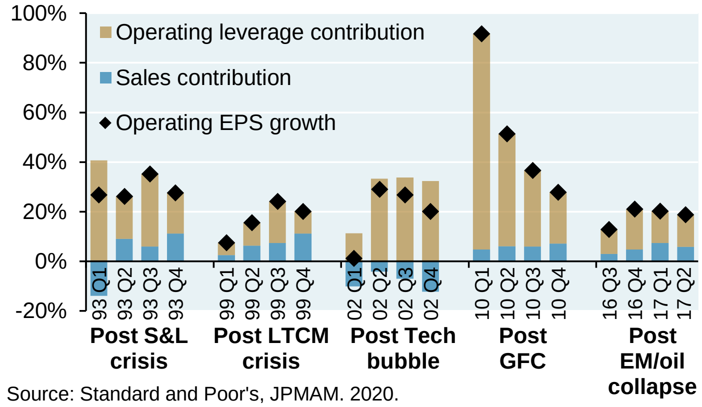
US companies often demonstrate "operating leverage" after recessions, which refers to EPS growth well in excess of low sales growth. This is shown in the second chart, and we expect the same to be true in 2021.

S&P 500 Q3 2020 consensus EPS expectations
y/y % change



Source: Factset. November 30, 2020.

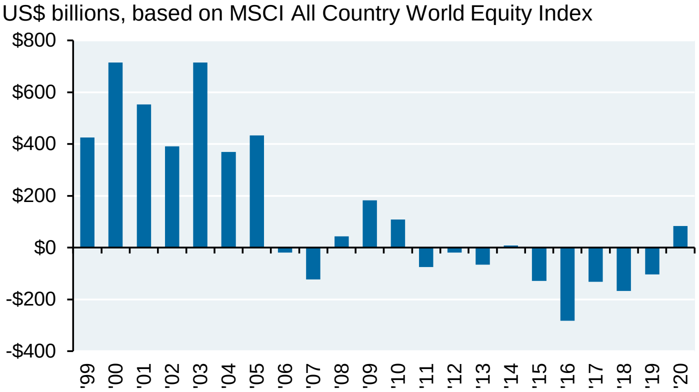
Contribution to S&P 500 profits from operating leverage after recessions and other market declines, y/y % change



Source: Standard and Poor's, JPMAM. 2020.

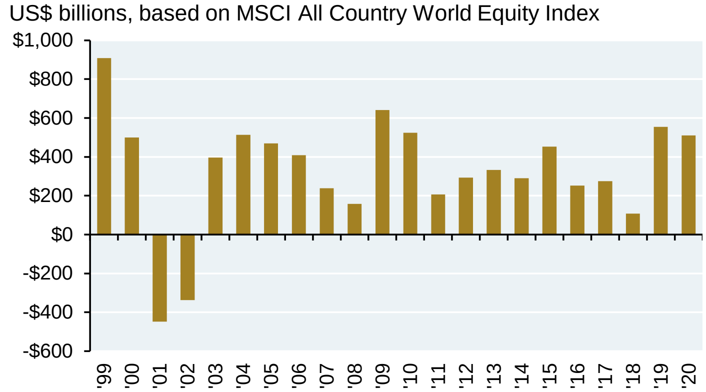
There are also technical factors at work that may explain why recent bear market recoveries have been so rapid. Since 2011, the pace of US buybacks and M&A have exceeded the pace of primary and secondary US equity issuance. As a result, the "stock" of investible public equity has not grown as it normally would, so when institutional investors rebalance, supply constraints accelerate the market's rise. Note that while this is true in the US, an equity shortage is *not* present outside the US where net supply is still growing.

Unprecedented low levels of net US equity supply
US$ billions, based on MSCI All Country World Equity Index



Source: JPM Global Markets Strategy. November 2020.

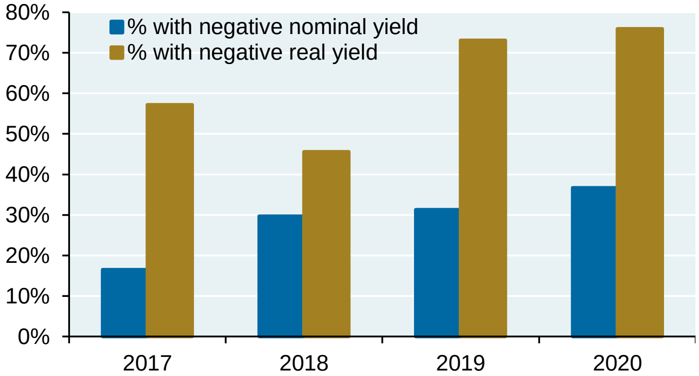
Non-US net equity supply still growing
US$ billions, based on MSCI All Country World Equity Index



Source: JPM Global Markets Strategy. November 2020.

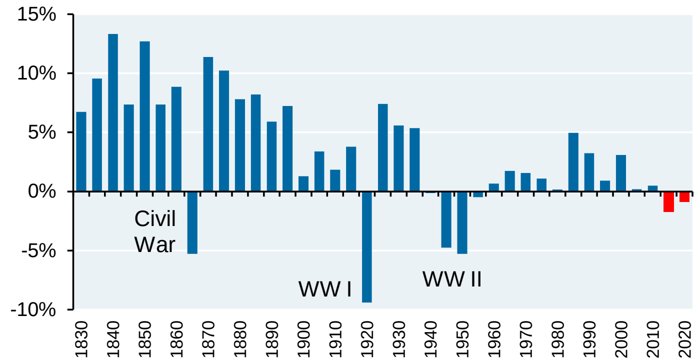
All that said, it's hard to escape the pervasive impact of zero interest rates on the investment landscape. The next chart shows how a third of all developed markets sovereign debt has yields below zero in *nominal* terms, while 75% has negative *real* yields (i.e., rates below the rate of inflation). The second chart indicates just how anomalous this is: the last decade has seen the longest sustained period of negative real policy rates in recorded US history, other than during the Civil War, WWI and WWII.

Developed markets negative yielding government debt
Percent of total debt



Source: J.P. Morgan Global Index Research. November 23, 2020.

Lowest real yields on cash since 1830, other than during wartime, T-bill/Funds rate less inflation, 5-year average



Source: FRB, Robert Shiller, GFD, BLS, JPMAM. November 2020.

The result: high equity valuations. The first table shows valuations compared to their history with 100% indicating maximum expensiveness. Some valuations might look lower if earnings outperform expectations next year, but not by enough to make a large difference. Sentiment is elevated as well, with most readings in the 90th percentile of optimism or higher[3]. If you're looking for bargains, be prepared: as shown in the second table, they're concentrated in energy, airlines, banks and sectors heavily affected by the pandemic.

It's worth noting that 90% of S&P 500 market cap is now based on **intangible assets** (R&D, intellectual property, software, etc), complicating historical comparisons. P/E ratios of the asset-heavy US corporate sector of the 1960s-1980s might not be the best comparison for today's asset-light, less capital-intensive S&P 500 universe. Intangible asset shares were 20% in 1975, 30% in 1985 and 80% by 2005. So, some upward drift in S&P 500 P/E ratios over time makes sense, in principle.

Even so, the equity melt-up which took place at the end of 2020 will probably limit market gains to ~10% in 2021. Consensus is bullish, which sets the stage for corrections and profit-taking from time to time.

Equity valuation percentiles (100% = most expensive)

S&P 500 valuation metric	Dec 2019 percentile	Current percentile
US market cap / GDP	99%	100%
Enterprise value / Sales	99%	100%
Enterprise value / EBITDA	93%	100%
Forward P/E	88%	97%
Price / Book	90%	93%
Cash flow yield	85%	93%
Cyclically adjusted P/E	89%	92%
Free cash flow yield	53%	60%
S&P earnings yield - 10Y UST	28%	33%
Median metric	**89%**	**93%**

Source: Goldman Sachs Investment Research. EBITDA = earnings before interest, tax, depreciation, and amortization. December 11, 2020.

Industries whose returns haven't fully recovered yet

S&P 500 Industry	2020 decline
Energy equipment & services	-37%
Oil, gas & consumable fuels	-34%
Airlines	-31%
Aerospace & defense	-17%
Banks	-15%
Gas utilities	-15%
Diversified telecom services	-12%
Leisure products	-9%
Multi-utilities	-8%
Real estate investment trusts	-4%

Source: Bloomberg. December 29, 2020.

[3] **Percentiles of investor optimism, measured since November 2016 (100 = most optimistic)**:
American Association of Individual Investors (98); Investors Intelligence Advisory Sentiment (95); NAAIM Active Managers Sentiment (99); and a measure of cash holdings of the 20 largest US equity mutual funds (100).

Market concentration and antitrust risks

Since 2016, 5 megacap stocks (AAPL, AMZN, MSFT, GOOG and FB) have represented a disproportionate share of market cap and return contribution. They're a lot more profitable than their late 1990s counterparts, and they're not as expensive in relative terms. That said, I don't think we should use 1999 as a benchmark to assess potential peak relative value; the demarcation line for market excess might be much lower than that. We're neutral on these stocks heading into 2021 for reasons explained in the Special Topics section on page 25 which covers antitrust risks at home and digital service taxes abroad.

As an alternative to the big 5 megacap stocks, consider other **secular high-growth stocks without antitrust baggage**. The table shows stocks that have generated strong revenue growth and are expected to keep doing so; which do not spend enormous amounts acquiring customers or indirectly paying contract labor (i.e., positive free cash flow margin); and which fly well below the antitrust radar (low share of industry revenues).

Contribution of top firms to overall US market cap

Source: Bloomberg. December 29, 2020.

S&P 500 megacap outperformance
Performance of market-cap weighted - equal weighted S&P 500, %

Source: Bloomberg. December 29, 2020.

Median free cash flow margin for 10 largest stocks within S&P 500 by market cap, Trailing 12 month free cash flow margin

Source: Factset. Q3 2020.

Top 10 companies in S&P 500 by market cap compared to bottom 100 companies by P/E, Ratio of median forward P/E ratios

Source: Factset. Q3 2020.

Secular growth stocks with strong fundamentals and lower antitrust risks

Aerospace & Defense	Communications Equipment	Health Care Supplies	Semiconductors
TransDigm Group (TDG)	Arista Networks (ANET)	Align Technology (ALGN)	Xilinx (XLNX)
Application Software	**Data Processing & Outsourced Services**	**Interactive Home Entertainment**	**Soft Drinks**
Adobe (ADBE), Autodesk (ADSK), ANSYS (ANSS), Intuit (INTU), Paycom Software (PAYC)	Mastercard (MA), PayPal Holdings (PYPL), Visa (V)	Take-Two Interactive Software (TTWO)	Monster Beverage Corporation (MNST)
Biotechnology	**Health Care Equipment**	**Internet & Direct Marketing**	**Systems Software**
Vertex Pharmaceuticals (VRTX)	ABIOMED (ABMD), Intuitive Surgical (ISRG)	Etsy (ETSY)	Fortinet (FTNT), ServiceNow (NOW)

Source: Factset, JPMAM. 2020. S&P 500 companies with 2018 & 2019 sales growth > 10%; projected 2022 sales growth > 10%; free cash flow margin > 15%; share of GICS subindustry revenues < 33%

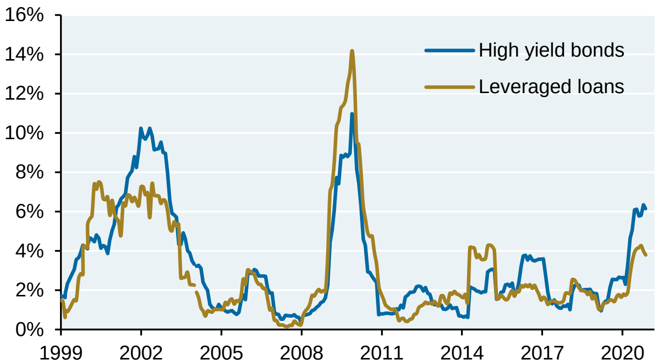
High yield: another beneficiary of financial repression

Monetary and fiscal stimulus provided impactful backstops for large and small companies. While the 2020 recession was twice as deep as in 2009, high yield and leverage loan **default rates** are showing signs of peaking at just half the 2009 level. The same is true for manufacturing and service sector **bankruptcy filings**, which have also already peaked at roughly half of 2009 levels.

The flood of liquidity prompted investors to pile into high yield bonds last year. Pay attention, however; underwriting standards and covenant protections have weakened sharply. In July 2019, we examined deteriorating underwriting standards in the loan market[4], and little has changed since then. While credit spreads have rallied, there are signs that investors have paid a price for overly aggressive underwriting: declining recovery rates on defaulted HY bonds/loans.

I don't have much to say about investment grade corporate bonds. Net of inflation, the yield on the Barclays Investment Grade Corporate Bond Index is now slightly *negative*. Pass.

US high yield bond and leveraged loan default rates
Last twelve month par-weighted default rate

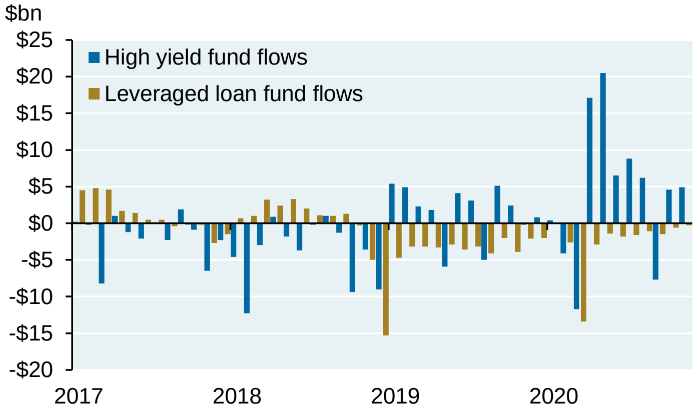


Source: J.P. Morgan Credit Research. November 2020.

US high yield corporate bond spreads
JPDFHYI index spread versus Treasury, basis points

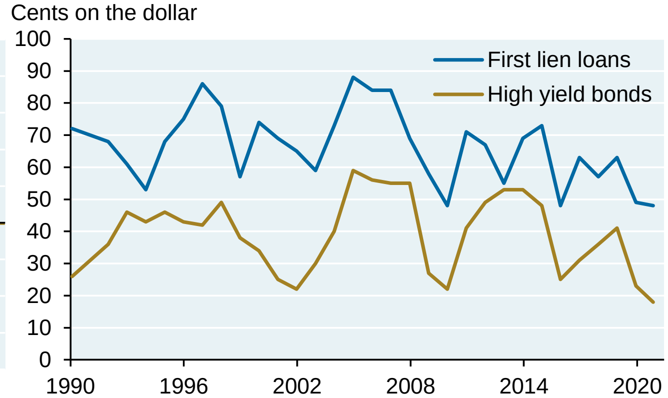
Source: Bloomberg, J.P. Morgan HY Team. December 29, 2020.

US high yield and leveraged loan fund flows
$bn



Source: J.P. Morgan Credit Research. November 2020.

US high yield bond and institutional loan recovery rates
Cents on the dollar



Source: J.P. Morgan Credit Research. November 2020.

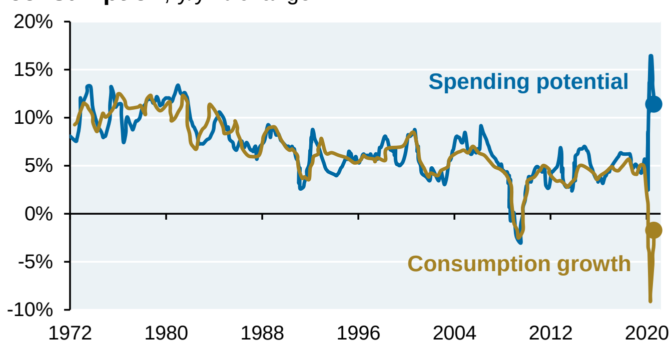
[4] Eye on The Market, "*The food fight over covenant-lite leveraged loans",* July 2019

Wrapping up: our 2021 Outlook and Special Investment Topics

It could take 3-4 months for vaccinations to permanently shift developed world hospitalization and mortality curves down given logistics involved[5]. Furthermore, the US is not only divided politically, but also medically: there's a lot of vaccine resistance, with recent polls showing that 15%-30% of Americans don't plan to get it (of countries surveyed, only the "French Resistance" is higher; see virus web portal Section 3).

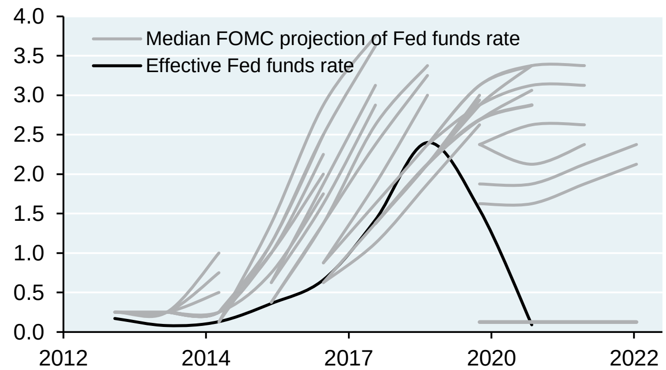
Even so, as vaccine rollouts eventually mitigate COVID risks, pent-up spending potential will be unleashed and we think the Fed will do little to constrain it. The first chart shows estimated spending potential compared to actual consumption; the gap is still large. While wage and salary growth has been weak compared to prior recessions, transfer payments have been much larger. On the Fed, the second chart is **cruel but fair**: for the better part of a decade, the Fed was wrong about where the economy was going as it consistently overestimated inflation risks, the strength of the recovery and the path of future policy rates. **After a decade of forecasting futility, my sense is that the Fed will wait to see a four-alarm fire of inflation before raising rates**. Other central banks will likely take the same approach; output gaps, which measure unused labor and industrial capacity, are large everywhere but China (see bottom 2 charts).

Due to COVID, potential spending exceeds actual consumption, y/y % change



Source: Empirical Research. Q3 2020. Spending potential: 65% of taxable income, 100% of transfer payments, 10% of housing wealth and 1.5% of financial wealth.

Fed projections vs actual Fed funds rate
Fed funds rate, %

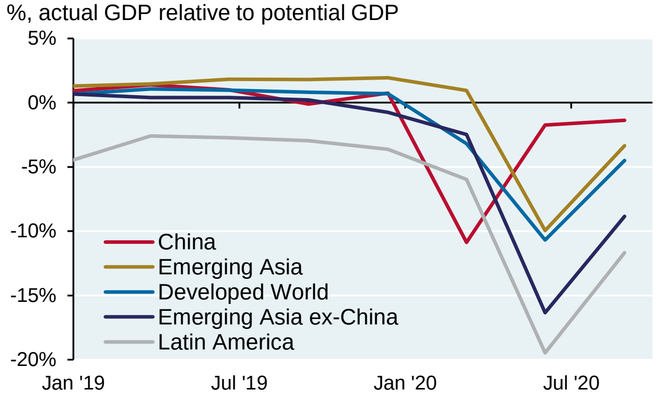


Source: Federal Reserve, JPMAM. December 15, 2020.

Output gaps (spare capacity measure), 2006-present
%, actual GDP relative to potential GDP

Source: J.P. Morgan Economic Research. Q3 2020.

Output gaps (spare capacity measure), 2019-present
%, actual GDP relative to potential GDP



Source: J.P. Morgan Economic Research. Q3 2020.

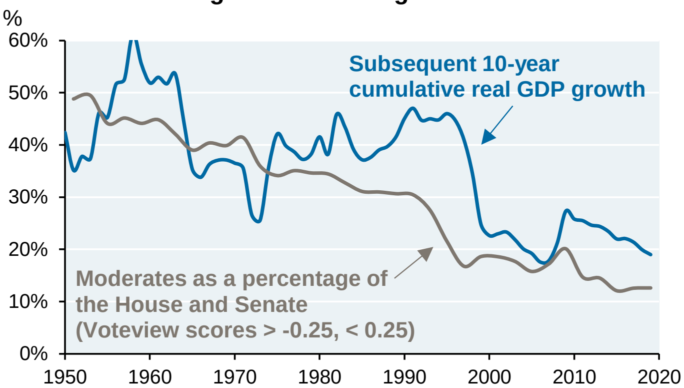
[5] The US is a long way from most estimates of **herd immunity:** CDC data as of October indicate that in 40 states, antibody presence was still less than 10%.

To conclude, we anticipate a year of ~10% US equity market gains in 2021 with bouts of profit-taking along the way, with the caveat that a lot rests on runoff election outcomes and filibuster decisions. We take a closer look at 10 Special Investment Topics starting on page 14, including deeper dives on China, Europe, Emerging Markets and tech antitrust issues. Here's a quick summary of other market views for 2021:

- Continue to overweight **US and Emerging Market equities** vs underweights to Europe and Japan
- **Look for better entry levels on renewable energy**. We don't anticipate a Green New Deal, but Biden can still disallow LNG export permits, tighten fracking rules on public lands, increase climate risk disclosure and reinstate auto mileage standards. Biden can also try to boost penetration of grid renewables through subsidies and eminent domain decisions on HVDC transmission infrastructure for wind/solar. Remember, US states set their own renewable portfolio standards; they are not set at the national level. We like renewable energy as an investment, but after the recent spike it pays to wait for better entry levels
- For deeper value, own **traditional energy** for reasons outlined in our 2020 Energy paper. Even after a 30% rally in November 2020, the S&P 500 oil & gas sector still trades at half the book value of the market, its lowest level since 1928. We see the loss of capital discipline rather than stranded asset risks as the primary driver of poor energy sector performance. In addition, we consider it unlikely that Biden will resuscitate an Iran deal that could release another 1mm bpd onto the global oil market
- **Infrastructure** stocks may benefit from a bill given bipartisan support (infrastructure ETFs and open-ended commingled vehicles investing in private infrastructure are two ways to express this view)
- Cautious on **large cap pharma**: a bipartisan prescription drug bill is possible, and the Executive Branch can also implement demonstration projects that bring Medicare Part D drug prices down to international levels

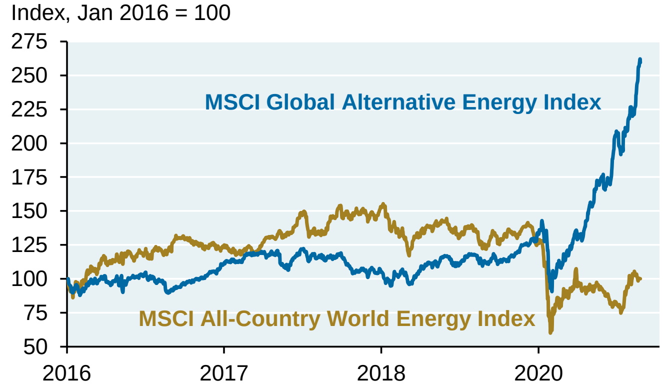
One last thing. Conventional wisdom is that Congressional gridlock is good for equity markets. This has been the pattern, and I suspect it will be true in 2021 as well. But there's a **difference between simple gridlock and what we have now**: as shown on the next page, the US is more intensely partisan than at any time in the last 100 years, and it's armed to the teeth by citizens who increasingly view the other side as immoral individuals with no integrity on politics and elections. Unfortunately, the collapse of Congressional moderates has coincided with a decline in US GDP growth, and that's not a good sign in the long run.

Moderates in Congress and GDP growth that followed



Source: Conference Board; Congressional Budget Office (GDP projections to 2028); Voteview database (Lewis et al., UCLA); JPMAM calculations. 2020.

Global alternative vs traditional energy performance

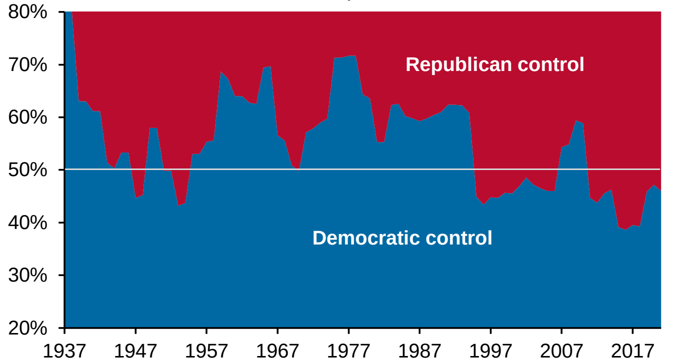


Source: Bloomberg. December 29, 2020.

Executive Summary Appendix: The US, at war with itself

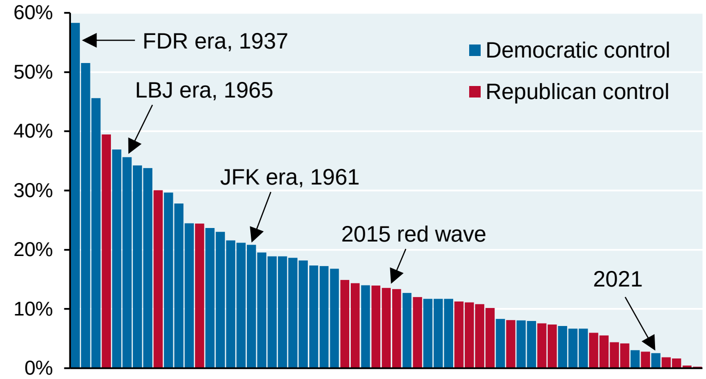
The partisanship balance across Federal and local branches of government is almost exactly split 50/50, and the Democratic advantage in the House is among the smallest since 1901.

Federal/State Partisan Balance Index, 1937-2021, % control of the House, Senate, Governorships, State Senates & State Houses



Source: House.gov, Senate.gov, NCSL, Southeast Missouri State University, Ballotpedia, Klarnerpolitics, JPMAM. 2020.

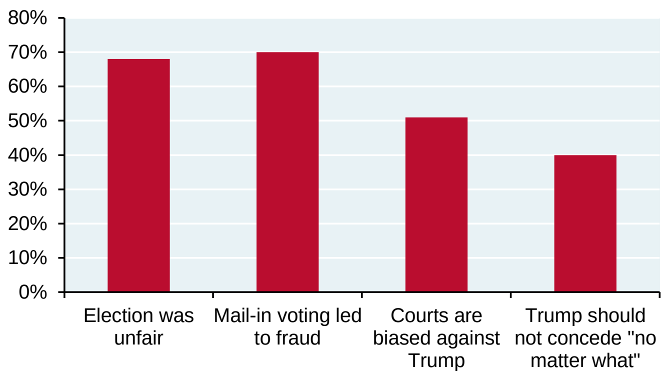
Partisan House leadership by majority party since 1901
%, in descending order of House advantage



Source: House.gov, JPMAM. November 2020.

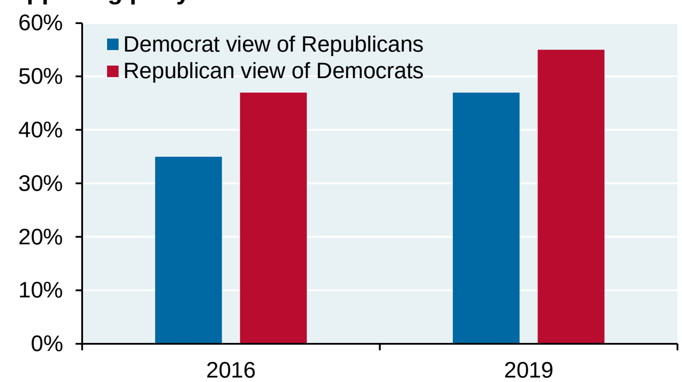
Many GOP voters believe the election was unfair, that mail-in voting led to fraud, that courts are biased and that Trump should not concede. More broadly, an increasing number of people see the opposing party as "immoral"; the feelings of attraction to one's own party are now for the first time outweighed by feelings of antipathy for the opposing party; and as shown in the last chart, the US has armed itself to the teeth.

GOP voter surveys
Percent of GOP respondents



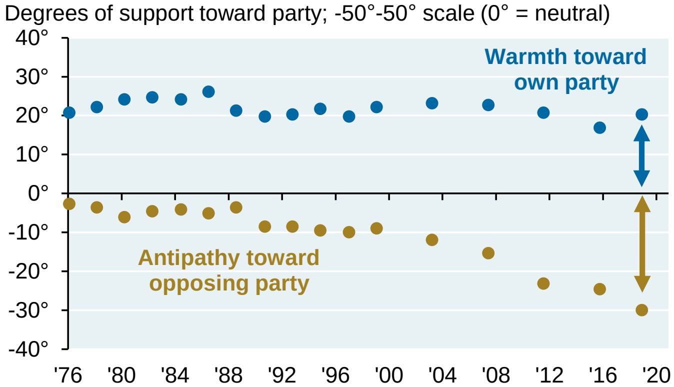
Source: Morning Consult, Politico. December 13, 2020.

Percentage of respondents who believe members of opposing party are immoral



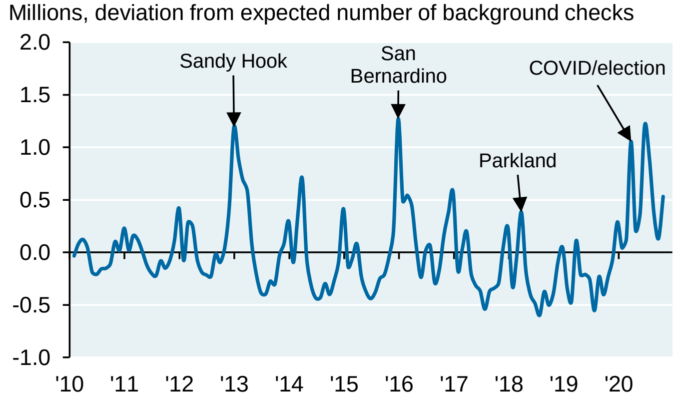
Source: Pew Research Center. 2019.

Survey respondents' feeling toward own vs opposing party
Degrees of support toward party; -50°-50° scale (0° = neutral)



Source: *"Political sectarianism in America"*, Finkel et al., Science Magazine. October 2020.

Monthly firearm sales, proxied by background checks
Millions, deviation from expected number of background checks



Source: FBI National Instant Criminal Background Check System. Oct 2020.

2021 SPECIAL INVESTMENT TOPICS

This year we take a closer look at **China**: at its trade and military conflicts with the US that coincide with its rising weight in global equity and fixed income indexes. We revisit reasons for consistent outperformance of US equities vs Europe and Japan, and the impact of negative policy rates on European banks. For value-oriented investors, we review **Emerging Markets** which we prefer to Europe given EM's valuation trifecta (P/E ratios, currency valuations and balance of payments risks). We examine **antitrust** and tax risks facing US megacap stocks, and for investors struggling with the impact of zero interest rates, we examine hybrid investments as means of boosting returns and the value proposition of gold. We conclude with a discussion on the US Federal debt and the durability of the US dollar's reserve currency status.

Please visit our virus web portal for detailed information on infections, mortality, vaccines, anti-viral medications and other therapeutic interventions, all of which you can access at the hyperlink above.

Special Topics

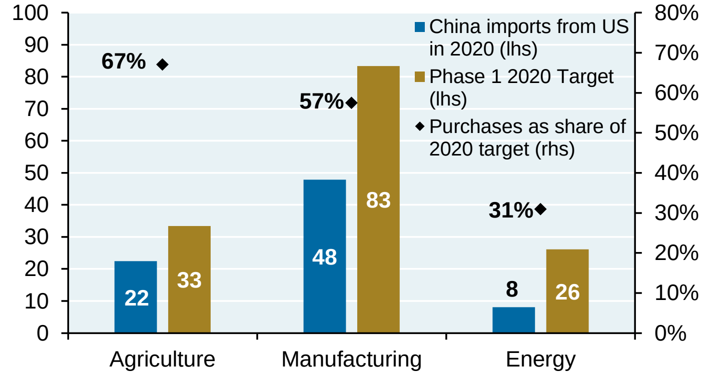
[1] US-China economic conflict: lower intensity, but here to stay

Equity markets began pricing in a substantial reduction in trade war intensity as expectations of a Biden victory rose. However, I think Biden will move slowly here; in 2016, Republicans gained voters in communities suffering most from Chinese import competition[6] and I suspect the same was true in 2020. While Biden might tone down the rhetoric, I'm not sure policies will be. China is only 30%-70% compliant with its Phase I trade deal purchase agreements, and there's bipartisan concern about Chinese mercantilism and human rights issues, including the issue of forced labor and US imports[7]. A positive early sign could be a deal in which tariffs are scrapped in favor of China's willingness to ease access to US services firms (finance, insurance, health, legal and e-commerce).

Relative performance of companies with high exposure to US-China trade war vs S&P 500, Jan 2018 = 100

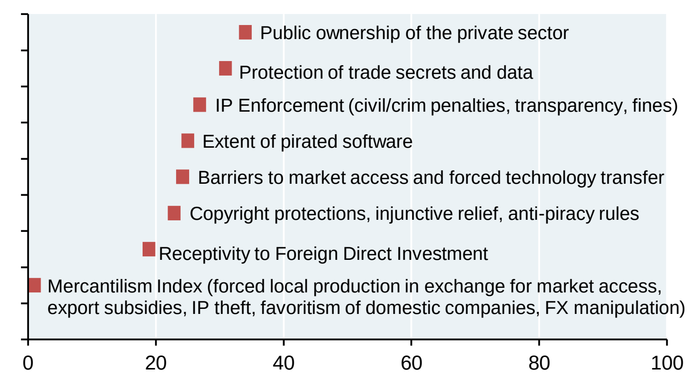
Source: Barclays Research, Bloomberg, JPMAM. December 16, 2020.

Progress of US-China Phase 1 purchase agreement
US$, billions % of 2020 target



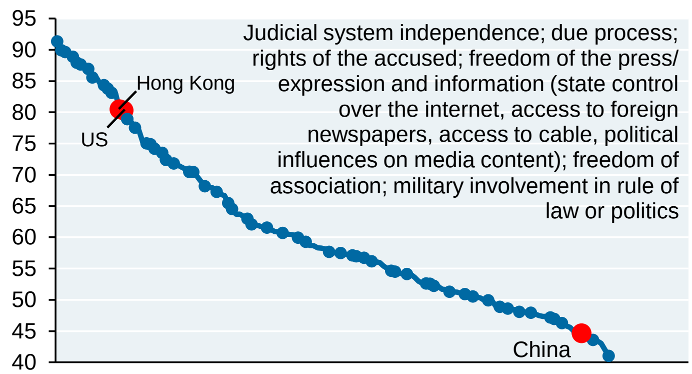
Source: US Census, USTR. November 2020.

China: the world's most mercantile country
China's score vs the rest of the world, 100 = best, 0 = worst



Sources: OECD, BSA, GIPC, ITIF, Fraser Institute, JPMAM. 2019.

The Rights of the Individual versus the State
100 = greatest protections of the Individual



Source: JPMAM, World Economic Forum, CATO, Fraser Institute. 2019.

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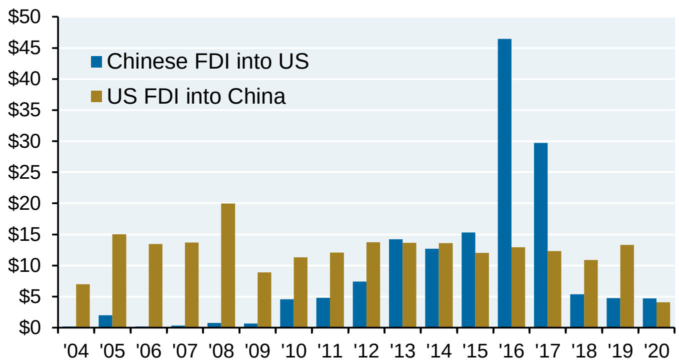
[6] "*A Note on the Effect of Rising Trade Exposure on the 2016 Presidential Election*", Autor (MIT) et al, March 2017. The authors found that rising import competition had a **large impact on Republican vote share gains**, and that Michigan, Wisconsin and Pennsylvania would have elected Clinton instead if the growth in Chinese import penetration had been 50% lower than its actual growth since 2000 (China's WTO entry).

[7] The **Uyghur Forced Labor Prevention Act** passed the House 406 to 3 and is expected to pass the Senate despite intense lobbying efforts of US companies whose supply chains may be affected. For background reading, see "*Uyghurs for Sale*", Australian Strategic Policy Institute, 3/1/2020, and "*China's Detention Camps for Muslims Turn to Forced Labor*", New York Times, 12/16/2018.

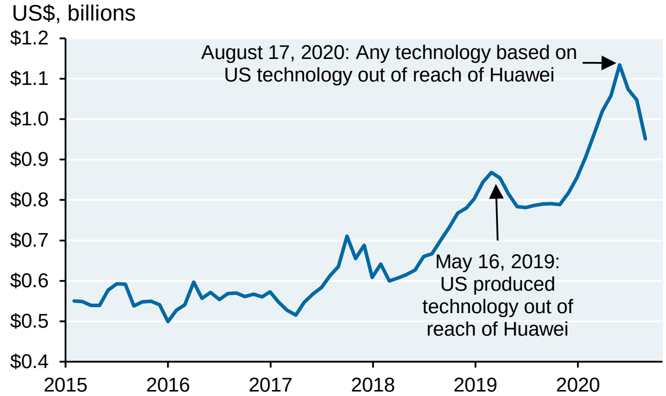
US-China economic conflict: tracking the consequences. The drop in bilateral foreign direct investment may be permanent given broader definitions of national security. US semiconductor exports to China continued to grow in 2020, but declined sharply with revised August export restrictions; it is still unclear how much of this decline is seasonal. As we explained in our 2019 Outlook, US semiconductor companies have 90%-95% global market share in advanced semiconductor chips/equipment needed for artifical intelligence, 4G/5G smartphones, autonomous cars, computer microprocessors and electric vehicles. While China aims to be self sufficient, its reliance on US semiconductor equipment is likely to remain for the foreseeable future. Lastly, many US multinationals do not plan to relocate out of China, perhaps because most of them operate overseas to meet local and regional demand rather than to export back to the US.

Decline in bilateral foreign direct investment may be permanent, US$ billions



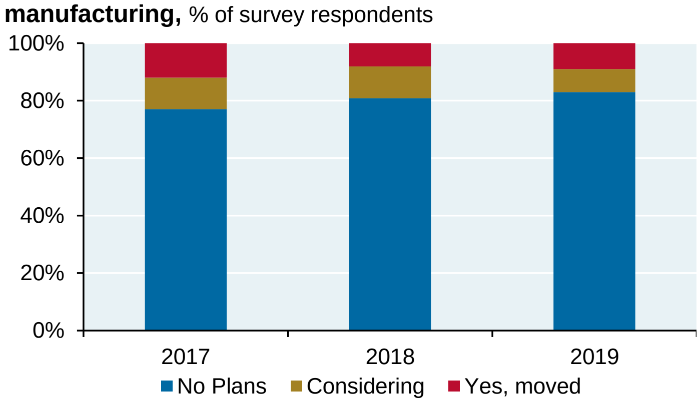
Source: Rhodium Group. 2020 data is through Q2.

US semiconductor exports to China
US$, billions



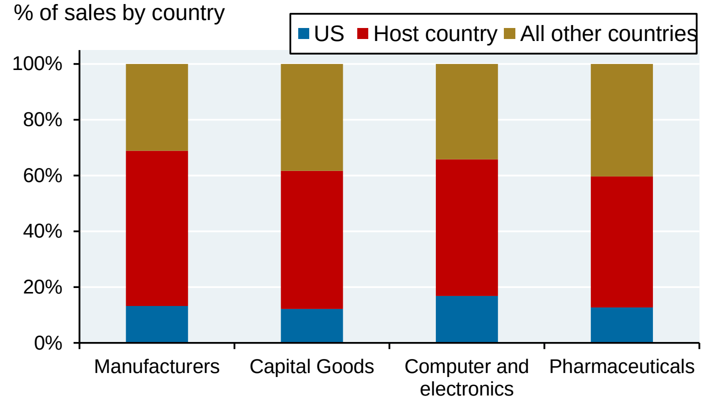
Source: US Census Bureau. October 2020.

US multinationals in China planning to relocate manufacturing, % of survey respondents



Source: AmCham China. March 2020.

US multinationals foreign affiliates' sales by country
% of sales by country



Source: Empirical Research Partners. May 2020.

In November 2020, the Trump administration **barred US investment in 35 Chinese firms due** to their ties to the Chinese military as part of the International Emergency Economic Powers Act. Most were not publicly traded, so this would impact at most 2% of the MSCI China index by market cap. This order is not scheduled to come into effect until mid-January, and might be reversed or softened by Biden or by the courts.

Another part of the divorce agreement: China has written into law that its companies cannot share financials with US regulators without permission from the Chinese gov't. In response, the US Public Company Accounting Oversight Board now considers its access to Chinese firms listed in the US to be blocked. Congress has passed the "Holding Foreign Companies Accountable Act" which will effectively **halt all new Chinese IPOs in the US and put Chinese companies currently listed on a 3-year countdown to delisting**. Currently, there are 365 Chinese companies listed in the US, but when measured by market cap, Alibaba represents 39% of that universe.

I do not believe Biden will spend scarce political capital going to bat for China this year, except in narrow circumstances with clear benefits for US workers. So, while we are optimistic on a global recovery next year, the China trade war stocks which have been rallying may run into headwinds. Furthermore, US companies selling to China may eventually suffer from reduced Chinese demand as China restructures its supply chain dependence on the US; i.e., no one wants to be the next Huawei.

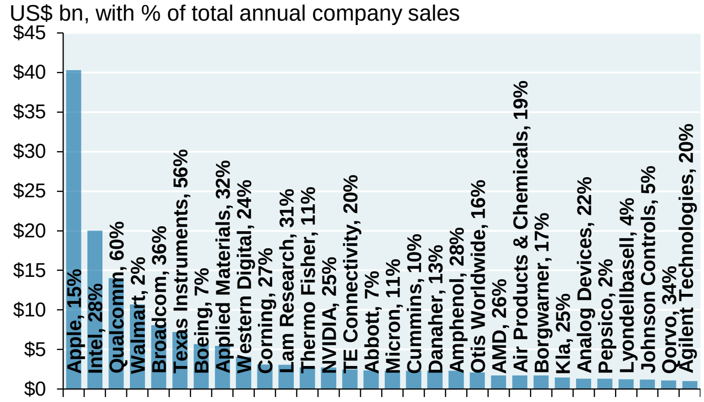
So far, Chinese responses to US sanctions and restrictions have been modest; perhaps China expects to negotiate different outcomes with a Biden administration. To be clear, China has leverage of its own. Over the last decade, US companies made large investments in Chinese subsidiaries. As shown below, the US trade deficit with China disappears once sales of in-country subsidiaries are included. In other words, **US companies are doing almost the same amount of business in China as Chinese companies are doing in the US, but through local subsidiary sales rather than through exports. That's where China has leverage: the ability to make life more difficult for US firms operating in China (i.e., for the companies in the last chart).**

Bottom line: in the absence of a reopening of trade talks, gradual bilateral disengagement is picking up steam and will impact US company earnings in small but measureable ways in the years ahead. US companies with replaceable supply chains and US broker-dealers profiting from Chinese capital raising may be first to feel it; and semiconductor companies may only have a few more uninterrupted years of demand before they're next.

The US does a lot of business in China, but through its in-country subsidiaries rather than via exports, US$, billions

Source: Deutsche Bank. 2019.

Select S&P 500 company sales in China
US$ bn, with % of total annual company sales



Source: Bloomberg. 2019. Includes co's that report sales from China >$1bn.

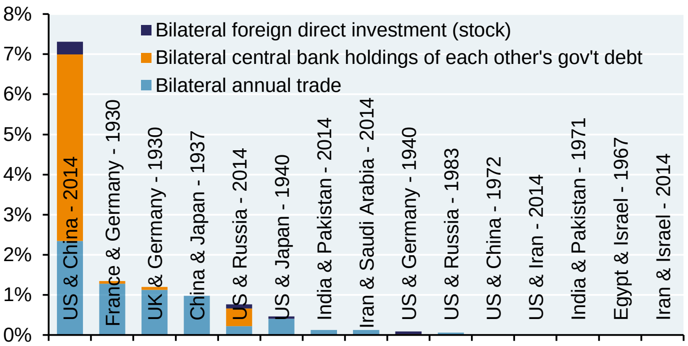
[2] US-China military conflict: the balance of power has changed

Economic linkages between the US & China are much larger than linkages between other adversaries of the 20th century. The first chart shows the details, and is based on an analysis we pulled together in 2018. The US/China bilateral trade and FDI numbers have fallen since then, but are still material; and this chart also does not measure bilateral sales of corporate subsidiaries discussed earlier. As a result, I'm not convinced by "Thucydides Trap" arguments on the inevitability of US-Chinese military conflict.

Is Taiwan a geopolitical flashpoint that investors should worry about? Some believe the answer is yes. Global markets are now more reliant on semiconductors than on oil/gas, and the Taiwan Semiconductor Manufacturing Company has overtaken Intel's market cap[8]. As a result, Taiwan's strategic importance to global supply chains is growing, US-China rhetoric has been deteriorating and in 2019, US arms sales to Taiwan reached their highest dollar figure on record.

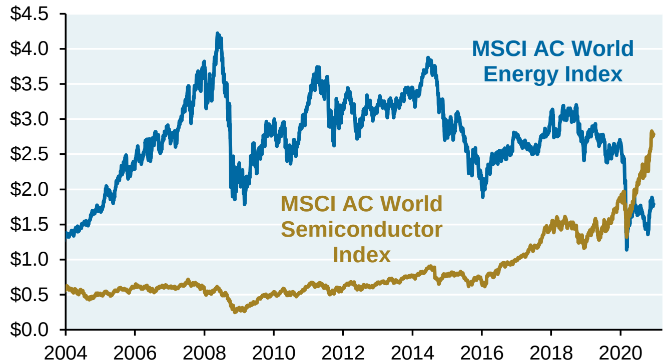
But something else has changed too: the ability of the US to impose its will militarily in the China region. Chinese military spending data is opaque; after normalizing for wage differences and purchasing power, a Heritage Foundation report estimated that China's military spending is ~90% of US levels. As illustrated on the next page using data from the RAND Corporation, Chinese military spending has changed the balance of power in the region, eroding the ability of the US military to enforce its protective umbrella arrangement with Taiwan. Should China ever challenge Taiwan's independent status, recent changes in relative power arguably reduce the likelihood of the US being drawn into a conflict it can no longer reliably win.

China and the US: much deeper economic linkages than actual and potential adversaries of the last 100 years
% of combined GDP in specified year



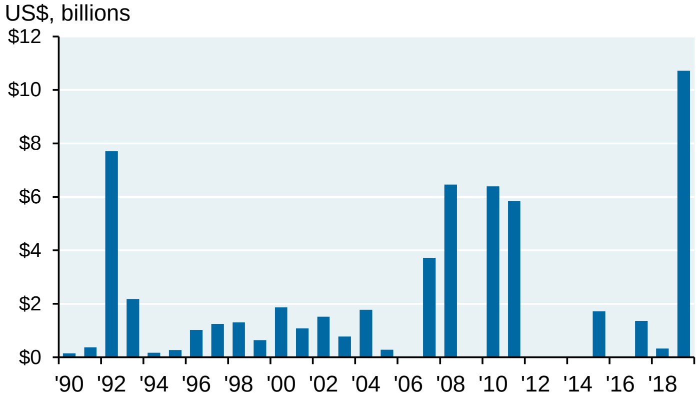
Source: JPMAM. 2016.

Global energy vs semiconductor market capitalizations
US$, trillions



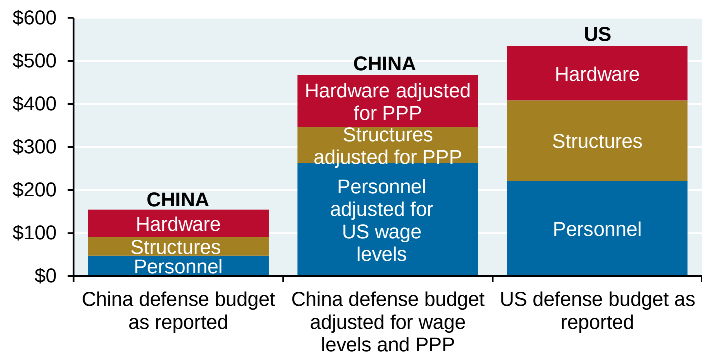
Source: Factset. December 28, 2020.

US arms sales to Taiwan
US$, billions



Source: US-Taiwan Business Council. 2019.

China and US military spending
US$, billions



Source: *"China's Defense Budget in Context"*, Frederico Bartels, Heritage Foundation. March 2020.

8 "*The New Geostrategic Pressure Point*", Louis Gave, Gavekal Research, November 3, 2020

The changing balance of power. The RAND Corporation published a 430-page analysis on the evolving balance of power between the US and China using historical data, forecasts and conflict models[9]. It's incredibly detailed, but there are a few exhibits that capture the main points. The charts below illustrate the evolving ability of the US to prevail in a conflict involving the defense of Taiwan. In many areas, China's military technology and skill levels are judged to still lag the US, but **the gap is closing and China also enjoys the advantage of proximity in most plausible Asian conflict scenarios**. Since the RAND publication was released, China has made **further military advances**: more naval destroyers, cruisers, aircraft carriers and assault ships; hypersonic and intermediate range ballistic missiles; anti-submarine warfare; and long range bombers.

First chart: the evolution of US air superiority in being able to prevail against Chinese surface to air missile systems. The area above and to the left of each curve represents RAND estimates of how often US forces would prevail as a function of US aircraft missile range and detectability. For example, in 1996, only highly detectable US aircraft with shorter range missiles would lose in battle. By 2017, US aircraft needed to be much less detectable and more weaponized due to improvements in Chinese air defense systems

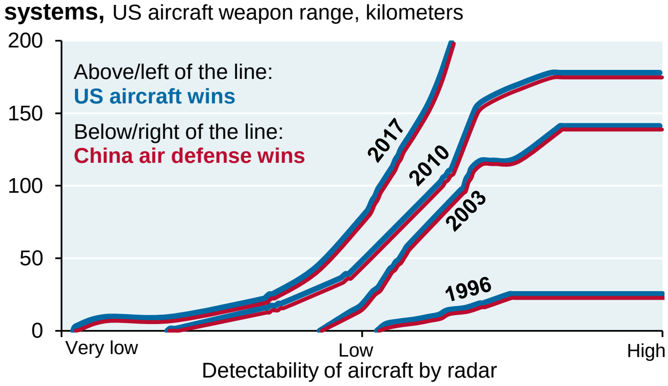
Second chart: estimates of US air force capacity required in the Taiwan region that would be needed to defeat a short-warning Chinese air attack emanating from its bases in Guangzhou and Nanking

Third chart: number of military engagement opportunities each Chinese submarine would have against US aircraft carriers stationed in the region over each 7-day period

Fourth chart: percentage of Chinese ships sunk by US submarines in a 7-day campaign

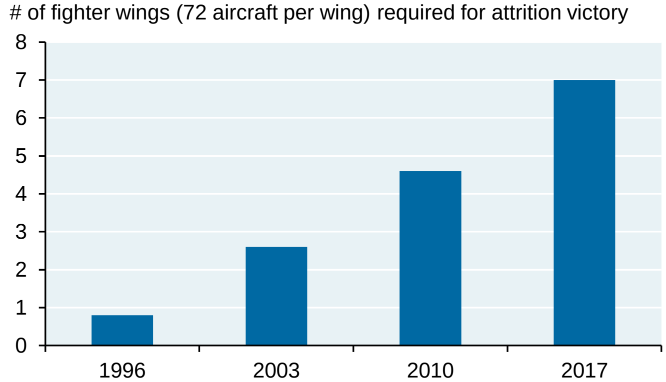
Each chart refers to a military conflict between the US and China with respect to the defense of Taiwan

Modeled estimates of US aircraft vs Chinese air defense systems, US aircraft weapon range, kilometers



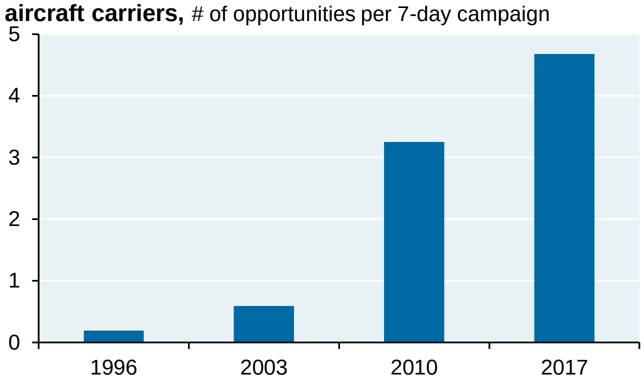
Source: RAND Corporation. 2015.

US air force capacity required to defeat Chinese air attack # of fighter wings (72 aircraft per wing) required for attrition victory



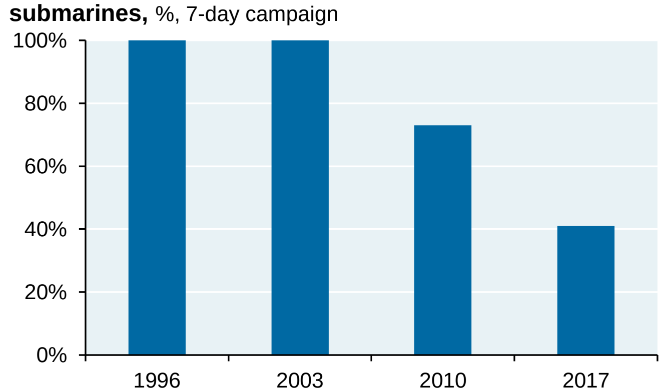
Source: RAND Corporation. 2015.

Chinese submarine engagement opportunities vs US aircraft carriers, # of opportunities per 7-day campaign



Source: RAND Corporation. 2015.

Share of China amphibious ships destroyed by US submarines, %, 7-day campaign



Source: RAND Corporation. 2015.

[9] "*The US China Military Scorecard: Forces, Geography and the Evolving Balance of Power, 1996-2017*", Eric Heginbotham et al, RAND Corporation

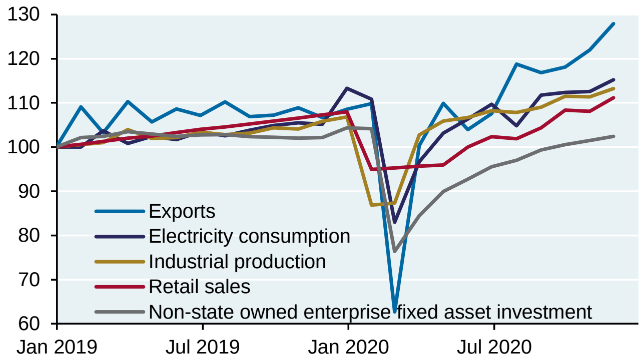
[3] The global investor underweight to China

At the same time that US-China trade and military risks are at their highest level in years, China's economy is booming again and its financial opening is leading to continued increases in China's weight in diversified global index products. We start with equities and then discuss fixed income.

Equities. China is *already* 40% of the MSCI EM Equity Index, and that's before further inclusion of A-shares. If A-shares were fully included at their current market cap, China's weight in the MSCI EM index could rise by 10% or more; the weight of A-shares in the MSCI China Index could grow from 11% to 40%; and A-shares alone could increase from 4% to 16% of the MSCI EM Equity Index. As shown in the third chart, while active managers are roughly market-weight now, this would change as MSCI inclusion rules evolve. The last chart shows how mainland China A-shares have among the lowest foreign ownership rates of major world equity markets.

Recent events: Ant Financial IPO, antitrust and a state owned enterprise default. Gavekal Research (HK) believes that the Ant Financial IPO termination, Chinese antitrust measures announced against Chinese tech firms and an SOE default in the coal sector are actually positive signs of pro-active risk management by Chinese regulators seeking to prevent bubbles and a market collapse[10]. I agree with them, particularly when thinking about US regulatory lapses and their market consequences over the last 20 years.

China economy monitor
Index, 100 = Jan 2019

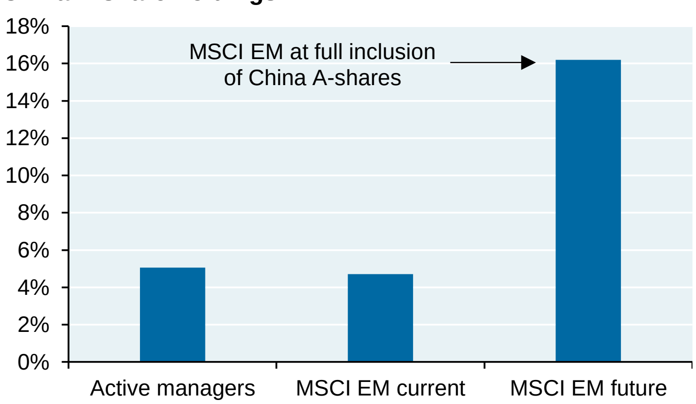


Source: China National Bureau of Statistics, General Administration of Customs, JPMAM. November 2020.

Current and potential MSCI China composition

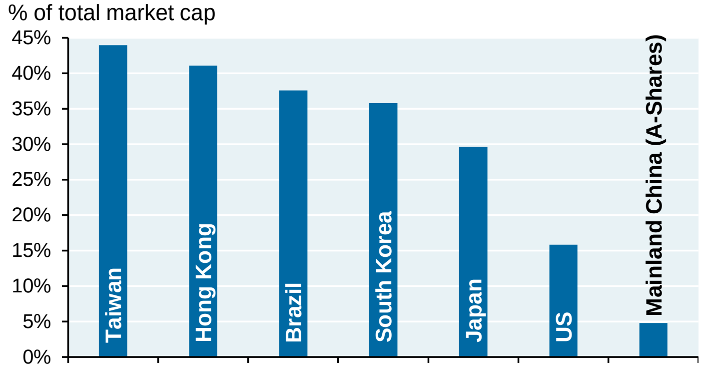
Source: KraneShares. February 2020.

China A-share holdings



Source: MSCI, Morningstar. Q2 2020.

Foreign ownership of domestic stock markets
% of total market cap

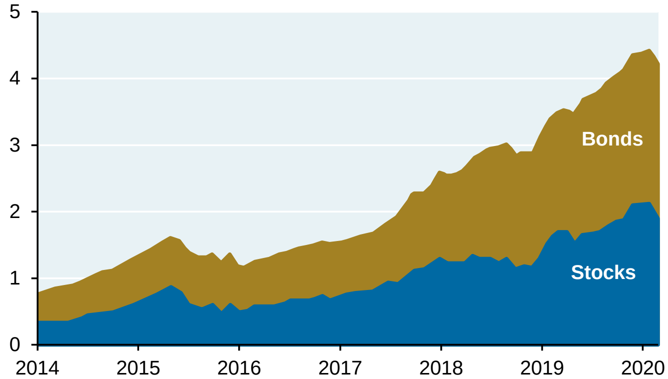


Source: Federal Reserve, National Conference of Stock Exchanges, HKEX, J.P. Morgan Emerging Markets Equity Research. November 2020.

[10] Louis Gave, Gavekal Research, "*Three Strikes And Still In*", November 23, 2020.

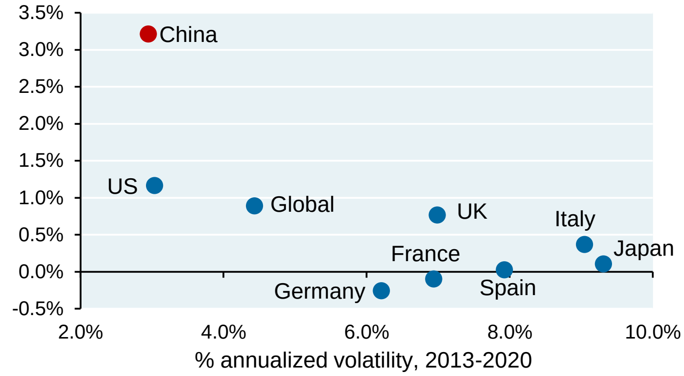
Fixed income. While foreign investors have been buying Chinese government bonds, the 2 trillion RMB added since 2014 only amounts to 2% of China's total domestic fixed income market (3% if we only include sovereign and financial sector issuers). China's current weight in the Barclays Global Aggregate is 3% and will rise to 6% upon full inclusion. Compared to other liquid global bond markets, China compares favorably with respect to current yield and volatility, and also has a lower duration.

Foreign investment in Chinese stocks and bonds
Trillions of RMB



Source: Peterson Institute for International Economics. February 2020.

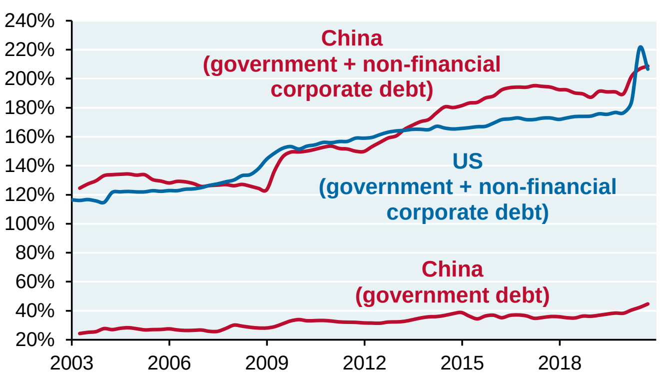
Yield to worst vs volatility of aggregate bond indices
%, yield to worst



Source: Bloomberg. November 18, 2020.

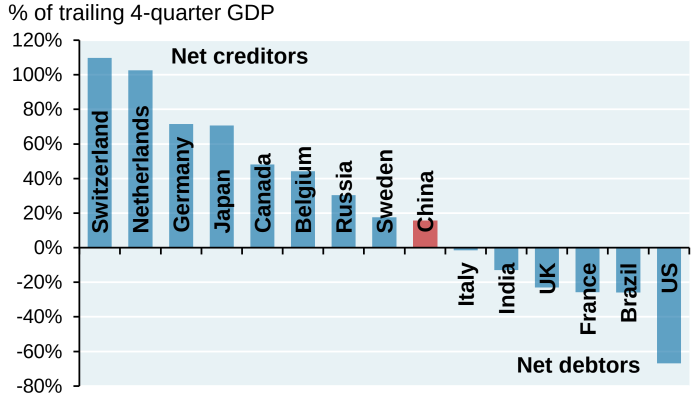
China credit risk. We typically look at gov't plus corporate debt in China since the division between Chinese public and private debt is blurred (debt of state owned enterprises can be considered corporate debt and/or a liability of the gov't). However, even though China's overall debt levels are just as high as the US, Chinese debt is owed mostly internally rather than externally. The last chart shows **Net International Investment Positions**, which measure each country's stock of foreign assets less foreign claims on that country's assets. China is still a net creditor nation, in contrast to the US. Another way to illustrate the same concept: **net external debt to GDP is 95% in the US and just 15% in China**. In other words, while China is an emerging market for equity investors, it is usually considered a developed market for fixed income investors.

General government and non-financial corporate debt
% of GDP



Source: Wind, CNBS, Federal Reserve. Q3 2020.

Net international investment position
% of trailing 4-quarter GDP



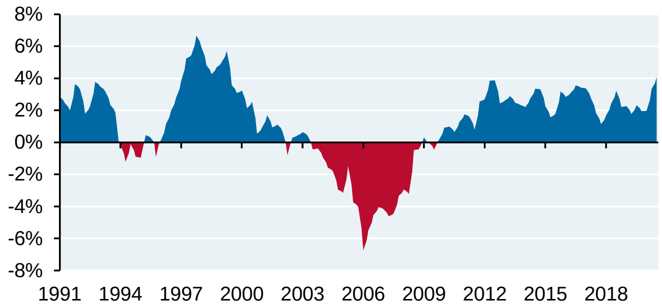
Source: BEA, central banks and government agencies, JPMAM. Q2 2020.

[4] Why does the US equity market keep outperforming Europe and Japan?

When someone tells you they're making a contrarian recommendation to overweight Europe or Japan vs the US, be sure and ask them how many times they made the same recommendation before. Why? **Because they were probably wrong when they did.** As we have illustrated multiple times, a strategy to overweight the US and Emerging Markets vs Europe and Japan has been one of the most consistently successful asset allocation approaches I have ever seen, and it worked *again* in 2020. Since January 2010, US equities generated total returns of 319% vs 124% for Japan, 87% for Europe and 73% for Emerging Markets.

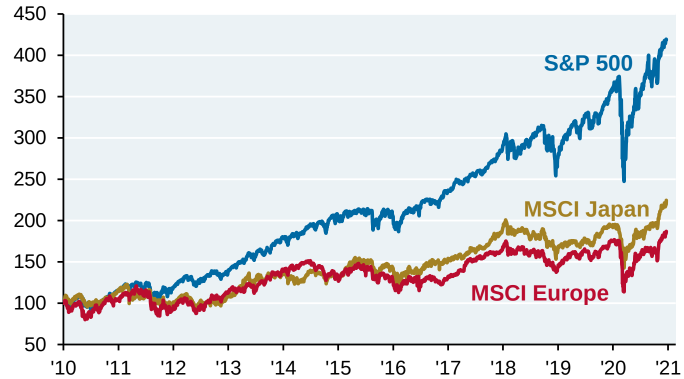
Why has the US consistently outperformed Europe and Japan? The most plausible reasons have more to do with micro than macro[11]. Think about where the largest equity market gains often come from in a low-growth world: the **Tech sector**, rather than sectors with lower and more volatile earnings growth (Basic Materials, Energy, Industrials). In the US, the Tech sector's weight is higher than the other three, while the reverse is true in Europe and Japan (3rd chart). And when we look *within* sectors, US companies generally have higher profitability than their European and Japanese counterparts (table); this is a very telling and important comparison, and **might be the best explanation of all.**

Overweight US, underweight Europe & Japan
3-year rolling out (under) performance vs MSCI All World Index



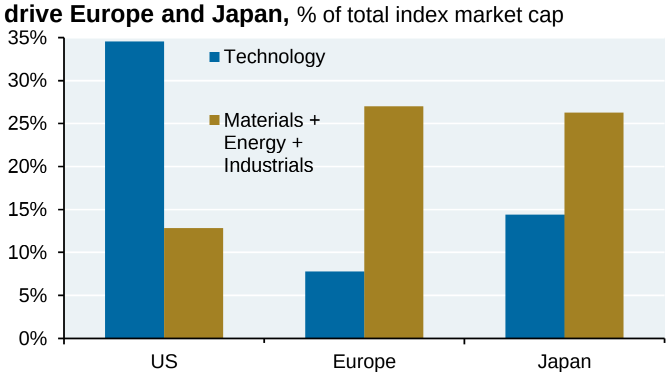
Source: Bloomberg, JPMAM. Q3 2020. All equity portfolio, rebalanced quarterly. 10% OW to US, 8% UW to Europe, 2% UW to Japan. Assumes no currency hedging.

US outperforming Europe and Japan
Total return in US$, Jan 2010 = 100



Source: Bloomberg. December 29, 2020.

High growth tech drives US markets, growth laggards drive Europe and Japan, % of total index market cap



Source: Bloomberg. December 29, 2020. Technology includes: GICS level 1 Information Technology + GICS level 3 Interactive Media & Services.

	Return on Assets: Higher in the US					
Country	Consumer Staples	Consumer Discretionary	Technology	Healthcare	Communication Services	Financials
US	6.9	4.1	9.9	5.8	4.4	0.8
Europe	5.1	0.6	5.4	4.9	1.5	0.2
Japan	2.9	1.7	3.9	3.7	3.4	0.2
	Return on Equity: Higher in the US					
Country	Consumer Staples	Consumer Discretionary	Technology	Healthcare	Communication Services	Financials
US	28.2	25.1	27.6	18.4	12.6	8.5
Europe	18.0	5.5	14.6	17.3	9.0	6.2
Japan	9.2	5.0	9.3	10.2	1.0	5.1

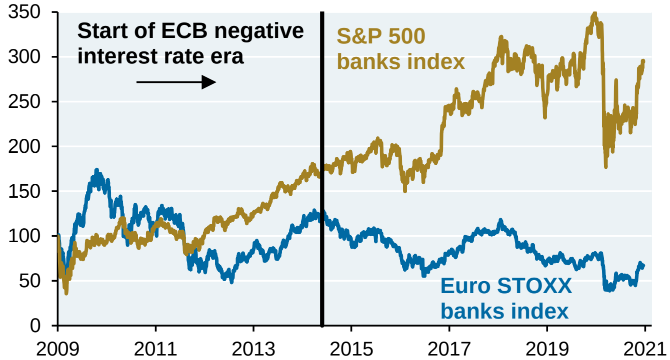
Source: Bloomberg. December 29, 2020.

[11] A macro explanation: since 2014, the **prime income population** (aged 30-49) in the US has been growing faster than in Europe. UN data indicates that this gap is expected to grow even wider from 2020-2025, as the US prime income population expands by 5% while the **European prime income population declines by 3%**.

[5] What are negative policy rates doing for European banks? Nothing good

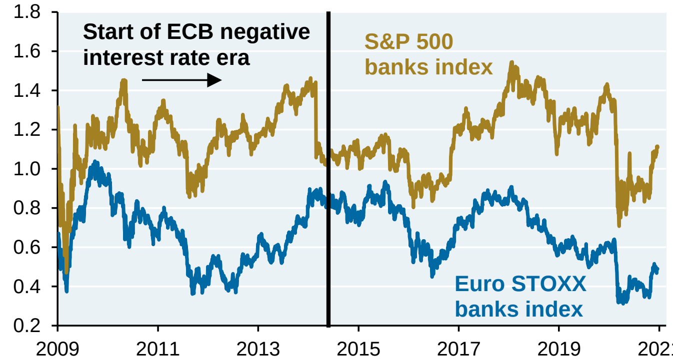
European bank equity returns and valuations have trailed the US since negative policy rates began in 2014. We don't know the counterfactual, and perhaps the ECB would argue that without negative rates, the region would be in even worse shape with rising corporate defaults making life even worse for banks. Whatever the case, negative rates have been a headache for bank investors in Europe, and it doesn't look like they're going away.

US vs Europe: banks total return performance
Total return in US$, Jan 2009 = 100



Source: Bloomberg. December 29, 2020.

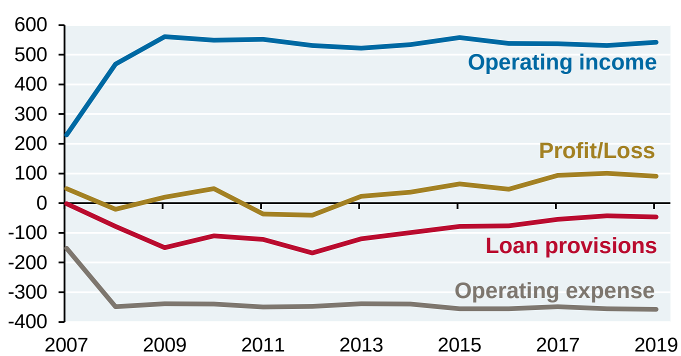
US vs Europe: banks price to book
Ratio



Source: Bloomberg. December 29, 2020.

The rise in European bank profits in the last couple of years is **almost entirely due to reduced loan loss provisions**, rather than resulting from rising operating income or falling operating expenses. In other words, this is **not an organic increase in bank profits**. As long as substantial parts of the European yield curve are negative (see table), I don't really see how this will change much.

Banks profitability driven by falling loan provisions
EUR billions



Source: ECB, Barclays European Research. 2019.

Percentage of J.P. Morgan GBI Broad Index trading with negative yields

Country	Total	1-3 Years	3-5 Years	5-7 Years	7-10 Years	10+ Years
Denmark	100%	100%	100%	100%	100%	100%
Finland	100%	100%	100%	100%	100%	100%
Germany	100%	100%	100%	100%	100%	100%
Netherlands	100%	100%	100%	100%	100%	100%
Austria	83%	100%	100%	100%	100%	54%
Sweden	82%	100%	100%	100%	100%	21%
Ireland	82%	100%	100%	100%	100%	39%
France	81%	100%	100%	100%	100%	45%
Belgium	75%	100%	100%	100%	100%	45%
Portugal	74%	100%	100%	100%	81%	0%
Spain	63%	100%	100%	100%	68%	0%
Japan	51%	100%	100%	100%	80%	0%
Italy	37%	100%	100%	0%	0%	0%
Total	64%	100%	100%	82%	77%	22%

Source: J.P. Morgan Global Index Research, J.P. Morgan Asset Management. November 30, 2020

Whether negative rates are a symptom, a disease or a cure, I hope they never emigrate from Europe to the US. Princeton economist Markus Brunnermeier believes in a "reversal rate": a tipping point beyond which damage to banks from further rate reductions outweigh benefits to the economy, in which case more **easing becomes contractionary rather than stimulative**. In other words, as bank profitability falls, their ability to generate new capital deteriorates, which undermines their ability to make new loans.

[6] Emerging markets: a trifecta of value

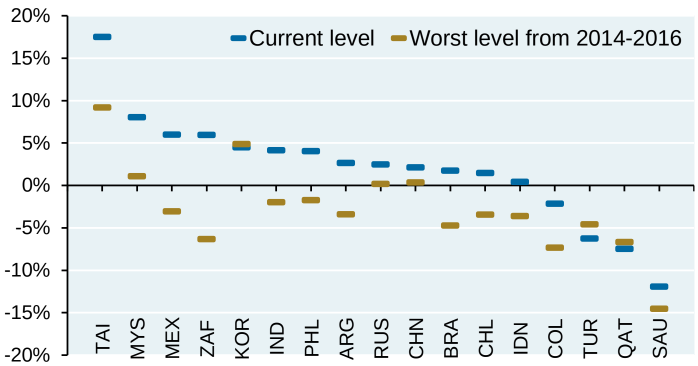
Let's keep this simple: emerging markets offer investors a trifecta of value right now.

- Improved current account deficits (i.e., less risk of balance of payments adjustments)
- Undervalued currencies
- Lower equity valuations than Europe

The past few years have been difficult for EM equity investors: China growth slowdown, commodity price collapse, US trade tensions, COVID-19, etc. However, we expect COVID risks to subside, EM recoveries are underway, US real interest rates remain low, China is recovering rapidly and many EM economies are running stimulative policies as well. Despite record *inflows* in November, EM equities are still on track for their largest yearly *outflows* on record in 2020.

Emerging markets current account balances

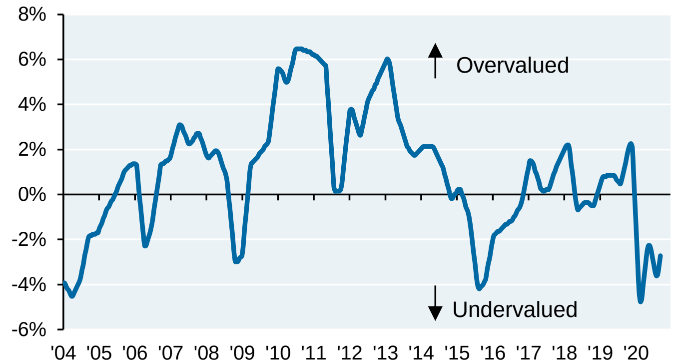
% of GDP



Source: Country central banks. Q2/Q3 2020.

Real trade weighted Emerging Market currency basket

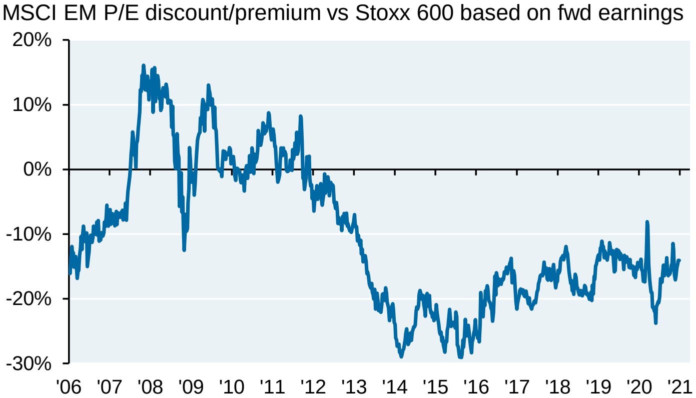
%



Source: Goldman Sachs Economic Research. November 2020.

Emerging Markets: P/E discount vs Europe

MSCI EM P/E discount/premium vs Stoxx 600 based on fwd earnings



Source: Datastream, IBES, J.P. Morgan Asset Management. Dec 25, 2020.

Regional equity returns since 2014

Total return in US$, Dec 2014 = 100

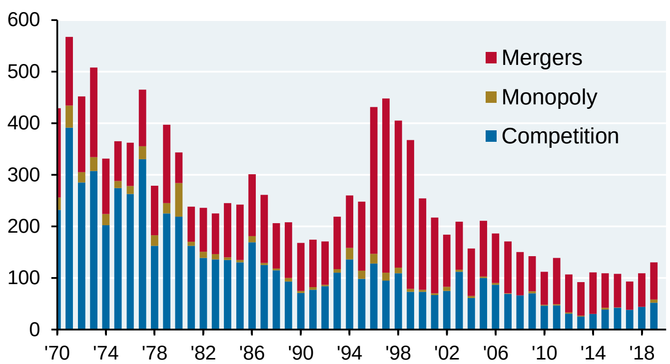
Source: Bloomberg. December 29, 2020.

[7] Antitrust enforcement: coming to a tech company near you

On page 9, we illustrate how critical the Big 5 stocks are with respect to overall US market capitalization and returns. That's why we're paying so much attention to signs of a rebirth in antitrust enforcement, which had fallen to a postwar low by the end of 2017. In addition to the DoJ Google lawsuit, we are also following: State Attorney General filings against Google for reasons that differ from the DoJ case; consumer rights advocate class action lawsuits for data privacy reasons; risks that Section 230 is revoked or amended (Section 230 provides indemnity against comments posted or censored); and the Facebook antitrust lawsuit filed by the FTC which seeks to force FB to unwind its acquisitions of WhatsApp and Instagram.

Since US Senate control is still unclear, it's premature to judge whether the October 2020 House Judiciary Report on antitrust (which reflected the majority Democratic view on the committee) will gain traction in Congress. Republicans disagree with many of its conclusions and remedies, and if the GOP controls the Senate this report will be nothing but a wish list. Even so, it provides a window into how the antitrust debate has been shifting and what long-term risks are for antitrust targets. **We dig into the details of this report on the next page, and into the details of the DOJ Google lawsuit on the page after that. We conclude with a discussion of digital service taxes applied by other countries to US tech firms**.

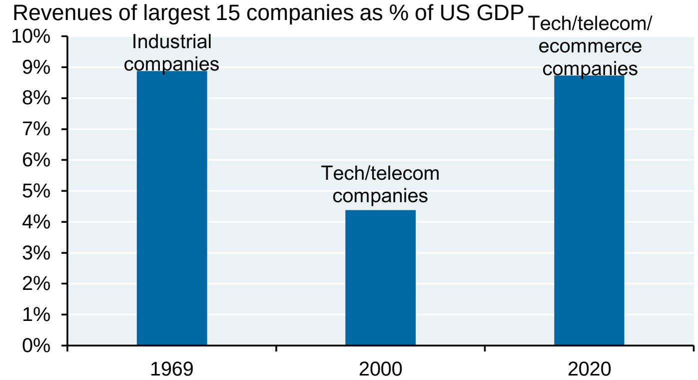
Number of Department of Justice antitrust investigations initiated



Source: United States Department of Justice. 2019.

Industry consolidation is now at prior 1969 peak

Revenues of largest 15 companies as % of US GDP



Source: Bloomberg, BEA, Fortune 500, J.P. Morgan Global Economic Research, JPMAM. 2020.

Market share overview for US markets

Category	Google	Apple	Facebook	Amazon	Subtotal	Microsoft	Total
Phone operating systems	**52%**	**47%**			99%	1%	100%
Video game streaming	21%		3%	**73%**	97%	3%	100%
Internet search incl. images, maps, YouTube	**91%**		1%	2%	95%	2%	97%
Navigation applications	**80%**	10%			90%		90%
eBooks		20%		**70%**	90%		90%
Web browsers	**51%**	**33%**			84%	7%	91%
e-Readers				**84%**	84%		84%
Email	**29%**	**46%**			75%	10%	85%
Internet search	**62%**				62%	**25%**	87%
Digital advertising	**39%**		20%	2%	61%	4%	65%
e-Commerce		6%		**54%**	60%		60%
Social media	1%		**51%**		52%	1%	53%
Digital storage	4%			**47%**	51%	10%	61%
Social media digital photos			**50%**		50%		50%
Mobile video and music	**34%**	8%		7%	49%		49%
Internet video	**29%**		11%	8%	48%	7%	55%

Source: Connecticut Public Interest Law Journal, US DOJ, SparkToro. September 2020.

October 2020 House Judiciary Report on anti-competitive tech behavior

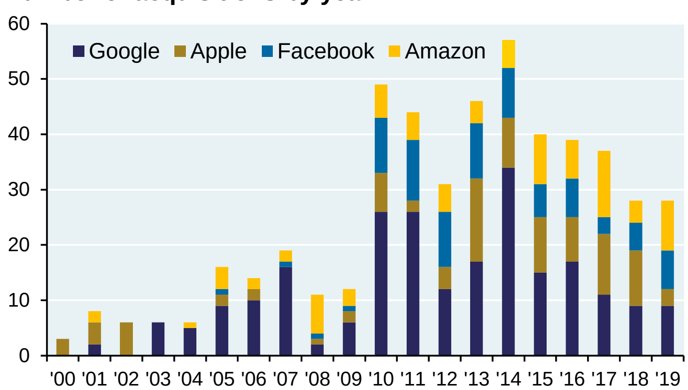
Facebook, Google, Amazon and Apple were cited in a House Judiciary Report released on October 6th for making acquisitions that stifle competition ("killer acquisitions"[12]), using market power to raise prices, misappropriating third-party data, stealing intellectual property and acting as market gatekeepers (i.e., controlling and serving a marketplace at the same time). The report's conclusions discard the "consumer welfare" standard that has guided antitrust enforcement over the past 40 years. Some firm-specific conclusions in the report:

- *Facebook*: social networking monopoly power that results from Facebook using superior market intelligence to identify nascent competitive threats and then acquire, copy, or kill them
- *Google*: online search and search advertising monopoly that is the product of anticompetitive behavior which includes undermining competition, misappropriating third-party data, and establishing their software as the default on most of the world's devices and browsers
- *Amazon*: durable market power in US online retail which results from acquiring competitors and abusing relationships with third party sellers beholden to Amazon, and from using control over the marketplace to find where its third party partners are doing well and copying their products to drive them out of business
- *Apple*: significant and durable market power in mobile operating system market resulting from its control of all software distribution to iOS devices

House Democrats favor a wide range of policies to combat these practices, listed below. The GOP does not agree and only favors a small number of them (highlighted in red). If Democrats win both GA Senate seats and jettison the filibuster these proposals would face a lower 51-seat Senate hurdle to pass, but it is not clear that there's unilateral support among Democrats for these policies. In any case, antitrust heat on tech may increase given greater Congressional scrutiny and a rejuvenated Department of Justice.

- *Restoring competition*: Glass-Steagall legislation for the tech sector (break up lines of business), rules to prevent discrimination and self-preferencing, merger prohibition, safe harbor for new publishers, prohibition on abuse of bargaining power and rules on data portability/interoperability
- *Strengthening antitrust law*: Reassert anti-monopoly goals of antitrust law, strengthen Section 2 of the Clayton Act (price discrimination), strengthen Section 7 of the Clayton Act (acquisitions that foster monopolies), restore enforcement Agencies to full strength, increase private enforcement

Number of acquisitions by year



Source: "*A topology of multi-sided digital platforms*", University of Connecticut Law School. June 2020.

[12] The phrase "**Killer Acquisitions**" was coined by Cunningham (LSE) and Ederer (Yale SOM) in a paper published in 2018. They used the pharmaceutical industry to illustrate how incumbent firms sometimes acquire innovative targets solely to discontinue the target's innovation projects and preempt future competition.

United States vs Google key issues[13]:

- The Justice Department case is *not* focused on Google's search engine or advertising revenue dominance, in contrast to the centrality of such issues in European antitrust investigations. Instead, the DoJ case focuses on Google's **exclusivity arrangements with its distributors**. Google pays billions of dollars each year to device manufacturers (Apple, Motorola, LG, Samsung), wireless carriers (AT&T, T-Mobile, Verizon) and browser developers (Mozilla, Opera, UC Web) to secure default status for its search engine. In the case of Apple, the DoJ claims that 15%-20% of Apple's worldwide annual income is derived from Google payments for search engine default status. In some cases, Google prohibits counterparties from dealing with its competitors, and requires placement of Google Apps in prime positions on devices
- A key concept from a speech by Assistant Attorney General Delrahim in 2019: "even if a company achieves monopoly position through legitimate means, it cannot take actions that do not advance plausible business goals but rather are designed to make it harder for competitors to catch up"
- Google has responded to such arguments by comparing its payments to distributors to cereal companies paying supermarkets to stock its goods on the best eye-level shelving. However, cereal consumption does not result in self-reinforcing market dominance. Google employs complex algorithms that learn which results and ads best correspond to user searches, and the more they do this, the better they get at it
- Some DoJ allegations about Google rhyme with antitrust arguments levied against Microsoft 20 years ago, such as restrictions Microsoft placed on equipment manufacturers to ensure installation of Internet Explorer and to suppress alternative operating systems. Currently, some antitrust analysts believe that Google and Apple impose restrictions on device manufacturers and App developers that have nothing to do with technical limitations or consumer security, and are instead designed to preserve market dominance
- There's a complicating factor**: the online world involves duopolies instead of conventional monopolies**. For example, Google/Facebook dominate digital advertising, Microsoft/Amazon dominate the cloud, Amazon/Google dominate shopping searches, and Microsoft/Google dominate productivity applications. As a result, the companies involved can mount vigorous defenses against monopolistic practice charges. Many of these duopolies can be seen in the table on the bottom of page 25
- How any given judge will rule on the case is unknown, but the DoJ case increases the risks for the big 4 tech and social media stocks that account for a growing share of market returns

[13] Sources include the University of Connecticut Law School ("*A topology of multi-sided digital platforms*", June 2020), University of Pennsylvania Carey Law School (*"Antitrust and Platform Monopoly",* September 2020) and Stratechery.com (October 21, 2020)

Additional risks: Digital Service Taxes targeting US tech giants gaining momentum

The US tech sector is facing **digital service taxes** (DST) on revenues paid to them by European advertisers. Tired of waiting for the OECD's "Pillar I" tax proposals to be sorted out, the UK, France, Spain, Italy and Austria have enacted DSTs of their own. The logic is based on a concept called "user-created value": since users of services like Facebook contribute to brand value by providing information to the company which enables it to earn ad revenues, users are undertaking so-called "supply-side functions" that would normally be undertaken by the business itself. Ergo, the jurisdiction in which users reside may tax this value as it is created, using locally generated ad revenues as a proxy. What concerns the EU: Facebook's tax bill for 2017 in France was less than 2% of that charged by low-tax Ireland (FB's European HQ), despite FB having 10 times more French users than Irish ones. DSTs would be paid by a company in addition to whatever income or consumption taxes the company is already paying in Europe.

A 2019 IMF paper described the theoretical underpinning of DSTs as problematic, and the Petersen Institute described DSTs as de facto tariffs discriminating against US firms. European governments have drafted language that avoids conceding that they are **taxing consumption of US services exports,** which are de facto tariffs that may violate existing bilateral tax treaties. The French Finance Minister said that its DST does not "single out US companies", but…

- Given high worldwide revenue thresholds France uses in applying digital advertising taxes and revenues that they apply to, **US tech giants (GOOGL, FB, AMZN, EBAY, UBER, ABNB) are practically the *only* entities subject to them.** Subscription fees and in-app purchases are excluded by France, which could have affected European firms. French officials stated that the DST was explicitly designed so as to avoid slowing down e-commerce innovation and the digitization of France's own businesses
- The French DST is applied **to gross revenues rather than net income,** resulting in double (or triple) taxation which contravenes the architecture of the international tax system in the developed world. Some DST proposals allow for VAT taxes to be deducted, another swipe at US firms that are not subject to them in their own jurisdiction

In 2019, the US countered with a proposal to tax marketing of intangibles (one that would also tax EU firms). The OECD tried to merge US and EU proposals, and then negotiations fell apart with COVID. In early 2020, the Trump administration threatened tariffs on French luxury goods if DSTs were not withdrawn; eventually Trump and Macron agreed to a truce and postponed tariffs and DST collections to the end of 2020 to allow more time for multilateral talks, though with the OECD talks currently stalled France recently demanded payment of 2020 taxes from US digital firms. Other European countries including Belgium, the Czech Republic and Hungary announced plans to impose digital taxes, and a high-level summit on an EU-wide digital tax is currently scheduled for March 2021. **The US is expected to retaliate against French digital taxes by imposing tariffs on French goods; how the US, the EU, the OECD and the WTO will resolve this is unclear.**

The US faces pressure to back down and agree to digital taxation given EU momentum and digital taxes adopted unilaterally by non-European countries including India, Indonesia, Mexico, Turkey, and Pakistan, and the recent announcement that Canada will impose a digital tax starting in 2022. **As countries adopt their own DSTs, the outcomes are important given the low effective tax rate of the US tech sector, its high degree of foreign-sourced revenue, and the potential for greater disruption from trade wars if and when the US retaliates with tariffs**.

The Tech sector: globally exposed and less heavily taxed

Revenue from Dev World ex-US (%total)		Effective corporate tax rate	
Tech	18%	Tech	23%
Industrials	18%	Consumer staples	24%
Consumer staples	15%	Industrials	24%
Banks	15%	Cyclical consumer goods	25%
Total	14%	Resources	31%
Non-cyclical services	13%	Non-cyclical services	31%
Other	13%	Cyclical services	31%
Cyclical services	10%		
Cyclical consumer goods	6%		

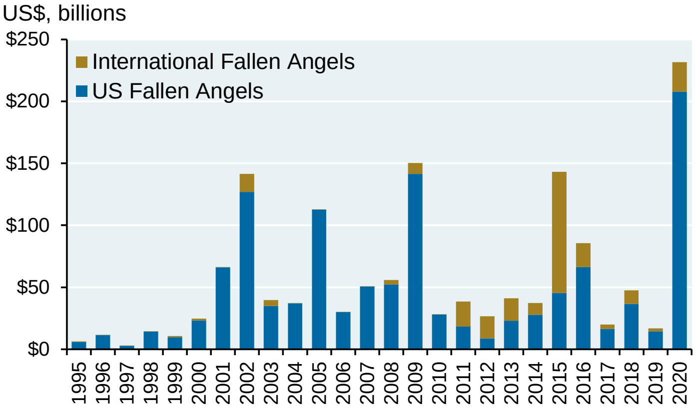
Source: Bridgewater. November 2020.

[8] Fallen angels and hybrid investments in diversified portfolios

Given the likelihood of low policy rates for the rest of our lives, many investors will seek to wring every bit of yield they can from portfolios. JP Morgan's Global Long Term Strategy Team recently published two pieces[14] on the subject: the importance of "fallen angels" in high yield portfolios, and the ability of "hybrid investments" to add portfolio returns as well.

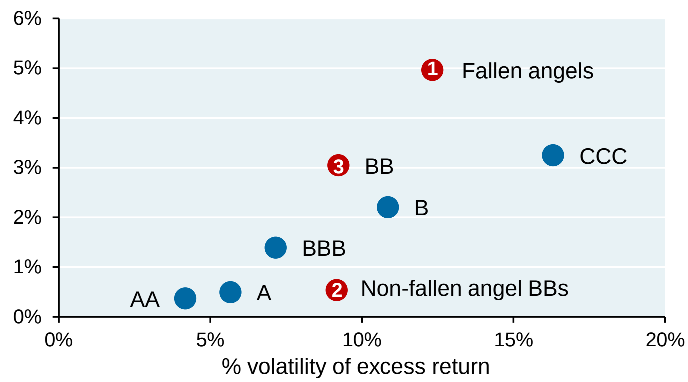
Fallen angels refer to investment grade corporate bonds that are downgraded to high yield. This tends to happen in recessions and also during periods of stress in specific sectors (energy in 2015-2016). While investing in fallen angels might appear to be like catching a falling knife, the last 15 years tell a different story. As shown on the right, fallen angels have been **volatile but have delivered attractive returns over risk-free bonds** (dot 1). In fact, without the contribution of fallen angel bonds, a BB-rated high yield portfolio would barely have generated excess returns at all (dot 2). The combination of the two is what has made BB high yield portfolios worth owning (dot 3), since that's where most fallen angels end up, at least temporarily. In 2020, the weight of fallen angels in the high yield BB rating category increased from 18% to 30%.

Global fallen angel volume
US$, billions



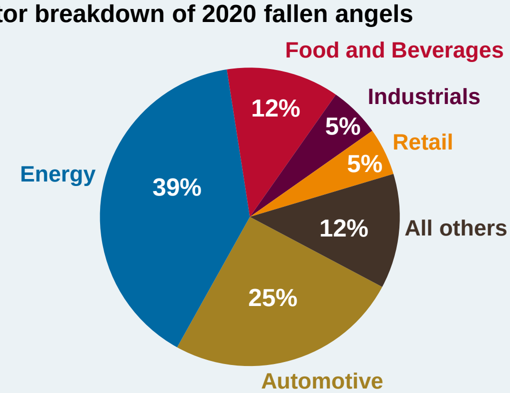
Source: J.P. Morgan Credit Research. 2020 data through November.

Return and volatility of US corporate credit by rating
% excess annualized return over UST, 2/2004-8/2020



Source: J.P. Morgan Global Long-Term Strategy. August 2020.

Sector breakdown of 2020 fallen angels



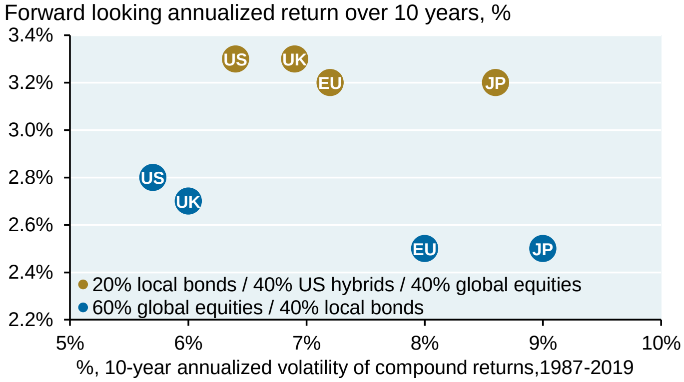
Source: J.P. Morgan Credit Research. November 2020.

[14] *"Fallen Angel and Buybacks: Strategy Update 2020"*, Jan Loeys and Shiny Kundu, J.P. Morgan Long Term Strategy. September 28, 2020; *"The international 60/40 problem and US hybrids"*, Jan Loeys and Shiny Kundu, J.P. Morgan Long Term Strategy. September 29, 2020.

With bond and equity valuations near all-time highs, is there anything investors can do to generate portfolio returns on the margin without taking as much portfolio risk? JP Morgan's Global Long Term Strategy Team also looked at this issue and focused on potential benefits from "hybrid" investments, which can include high yield bonds and loans, collateralized loan obligations (CLOs), commercial mortgage backed securities (CMBS), convertible bonds, equity REITs and mortgage REITs, preferred stock and utility stocks. The common feature: potential to generate equity-like returns with lower long-term end of period risk to your wealth.

Of the hybrid asset classes listed above, the JP Morgan analysis focused on just four: high yield bonds, equity REITs, utility stocks and convertible bonds (mostly due to historical data availability). They consider this subset representative of the broader universe of hybrids given similar return and volatility profiles. We synthesized their analysis in the chart below, which compares forward-looking expectations on 60-40 portfolios and "hybrid" portfolios (40% hybrid, 40% stocks, 20% bonds). **The analysis projects a modest pickup in return in exchange for a modest pickup in risk.**

Traditional 60/40 portfolio vs portfolio with hybrids
Forward looking annualized return over 10 years, %



Source: J.P. Morgan Global Long-Term Strategy. Sept 2020. Volatility data for Europe begins in 1995.

The JP Morgan analysis is meant to inform long term investors, so it computes risk annualized measures over three decades. That's fine, but measuring volatility over a 30 year period can smooth over some very rough patches. In 2009, many hybrid investments experienced levels of volatility that were not that different from equities. The table shows how all 9 classes of hybrids performed during the Great Financial Crisis and during the COVID crisis. As an investor's lens shifts from daily to monthly to quarterly performance, the drawdowns get a bit smaller. **Even so, given their performance during market crises, long term investors need to truly commit to the phrase "long term" to reap the benefits of hybrid investments in diversified portfolios.**

Hybrids	2011-2019 Annualized Return	2008-2009 recession max drawdown			2020 recession max drawdown		
		Daily	Monthly	Quarterly	Daily	Monthly	Quarterly
High yield bonds	6.8%	-35%	-32%	-25%	-21%	-13%	-13%
High yield loans	4.5%	-31%	-28%	-28%	-21%	-14%	-13%
CLOs	3.9%*	N/A	N/A	N/A	-15%	-9%	-8%
CMBS	4.3%	-41%	-33%	-21%	-12%	-5%	-2%
Convertible bonds	9.4%	-44%	-39%	-33%	-27%	-16%	-14%
Equity REITs	11.0%	-68%	-62%	-58%	-42%	-24%	-23%
Mortgage REITs	4.5%	-72%	-67%	-51%	-71%	-61%	-59%
Preferred stock	6.5%	-64%	-54%	-42%	-33%	-16%	-15%
Utility stocks	12.3%	-50%	-41%	-39%	-37%	-20%	-15%
Average	7.0%	-51%	-45%	-37%	-31%	-20%	-18%

Source: Bloomberg. December 17, 2020. *Annualized return for CLOs is from 2012-2019.

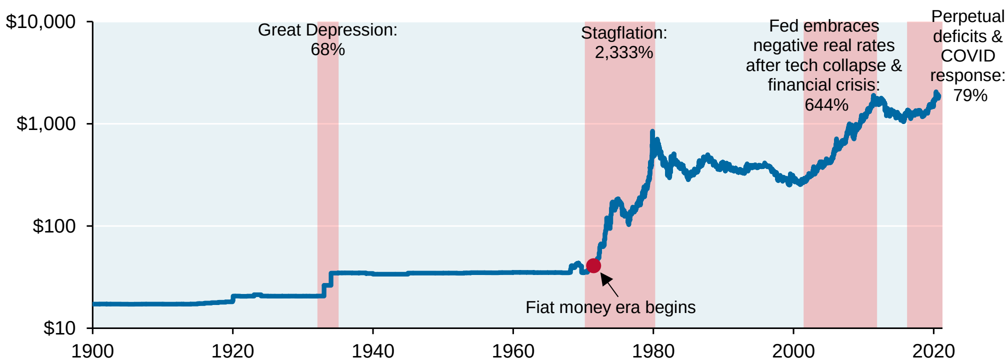
[9] Gold rally: modest so far

Gold is up ~80% from its post-financial crisis low. The next chart shows the latest gold spike and 3 prior ones:

- the 1930s, when Japan, Germany, the UK, the US and France in succession abandoned gold standards to combat deflation
- the 1970s, after Nixon took the US off the gold standard and the Fiat Money system began
- the 2000s, when the Federal Reserve for the first time in its history began using negative real interest rates as a policy tool outside of wartime

In other words, when gold rallies, it has the potential to rally a *lot*.

When gold prices rise, they usually rise by a lot
US$ per Troy Oz, log scale

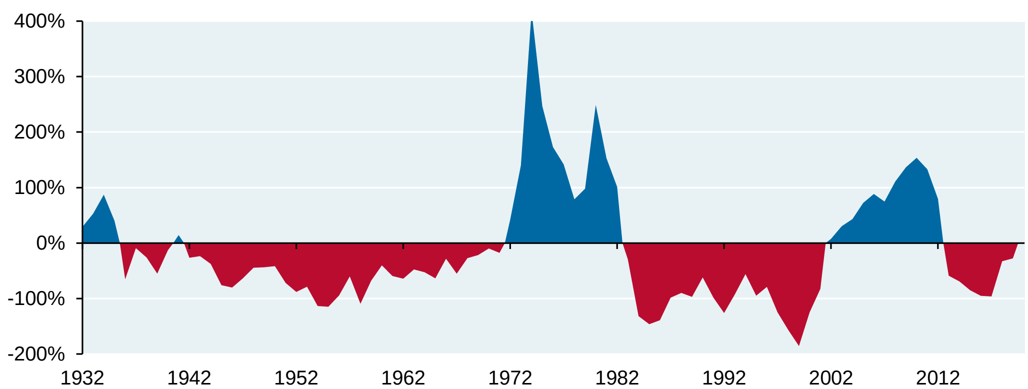


Source: Bloomberg, J.P. Morgan Cross Asset Strategy. December 29, 2020.

The challenge for investors: many years can elapse between gold rallies. The next chart shows the performance of gold vs a diversified portfolio of financial assets since the 1920s. Gold underperformed before WWII, but this is an artifact of fixed gold prices not comparable to today. Gold outperformed during the 1970s, but then gold bugs had to wait 22 years before reaping net portfolio benefits again. Gold outperformed from 2002 to 2012, and then another period of gold underperformance set in which is even now only on the cusp of reversing.

As illustrated in the Executive Summary, COVID stimulus eclipses all prior crises. Furthermore, money supply has surged relative to gold production, something which preceded prior gold rallies. Neither US political party appears interested in deficit reduction, and proponents of Modern Monetary Theory fuel that lack of concern further. Maybe that's why major Central Banks became net buyers of gold again over the last 2 years after being net sellers[15]. So, I sympathize if you believe that gold's outperformance is just the beginning. **But be prepared: the wrong timing on a gold call can take a generation or more to reverse.**

The infrequent outperformance of gold
5 year rolling out (under) performance of gold vs balanced portfolio (65% stocks, 25% bonds, 10% T-Bills)



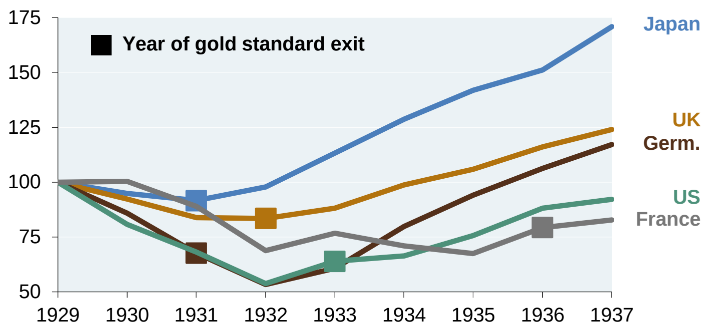
Source: A. Damodaran (NYU), Bloomberg, FRED. December 29, 2020.

[15] In Q3 of 2020, central banks became net sellers as some financially-stretched countries like Turkey raised funds to deal with the COVID pandemic. We expect this to be a temporary lull and for central banks to resume buying gold in 2021.

We conclude this section with 4 gold related charts:

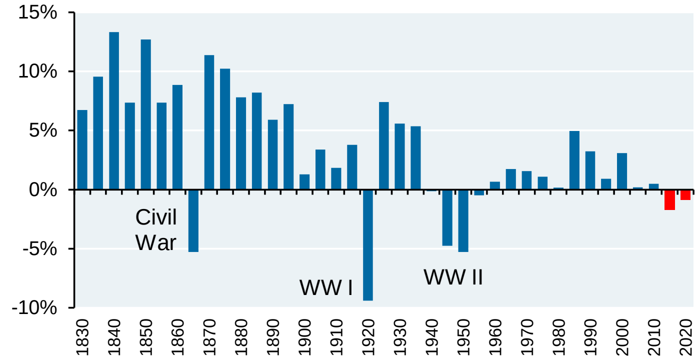
1. Barry Eichengreen at UC Berkeley found that the sooner a country abandoned its gold standard during the Great Depression, the faster it recovered
2. Following the tech collapse and the financial crisis, the Fed adopted a new strategy: negative real interest rates, which had never occurred in the economic history of the US outside of wartime
3. US money supply has surged relative to gold production, which preceded both prior gold rallies
4. Central bank gold holdings as a % of total reserves are at their highest level since 2002

The earlier a country abandoned its gold standard, the faster its economy recovered, Index, 1929 = 100



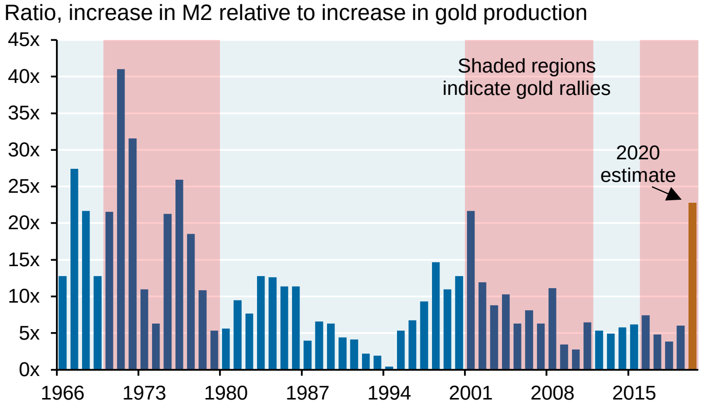
Source: *"The Origins and Nature of the Great Slump Revisited"*, Barry Eichengreen, Economic History Society, 1992.

Lowest real yields on cash since 1830, other than during wartime, T-bill/Funds rate less inflation, 5-year average



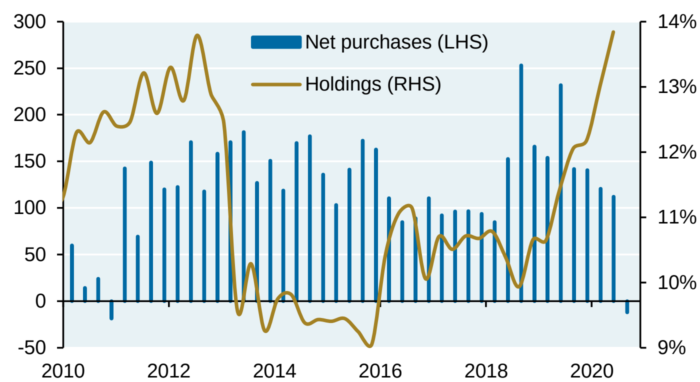
Source: FRB, Robert Shiller, GFD, BLS, JPMAM. November 2020.

Growth in US money supply vs global gold production
Ratio, increase in M2 relative to increase in gold production



Source: Gavekal Research. Sept 2020.

Global central bank gold purchases and holdings
Tonnes % of total reserves



Source: World Gold Council. Q3 2020.

[10] US Federal debt increase is probably permanent

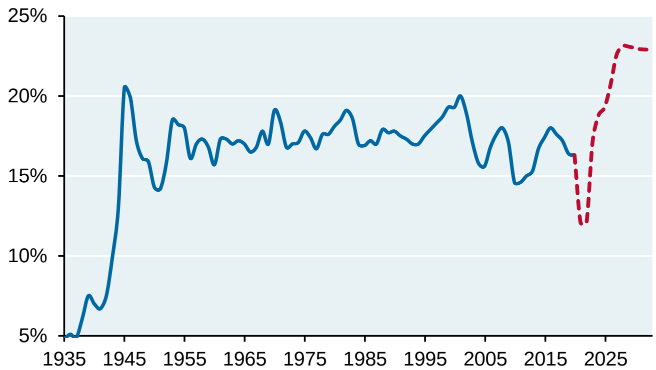
What would it take to get US Federal debt back down to pre-virus levels of 80% by 2030? We worked with the **Committee for a Responsible Federal Budget** to find out. Here are the mutually exclusive answers, which are also illustrated in the charts:

- Enact the largest tax hikes in US history
- Slash spending to the lowest level in 80 years
- Somehow generate a real GDP growth boom last seen in the US 50 years ago
- Spark higher inflation (but not so high that it would increase real interest rates, slow growth or lead policymakers to enact additional spending to compensate for higher prices)

Since most of this is not politically or economically feasible, the US will have to get used to permanently high debt levels. I understand COVID stimulus: by sustaining private sector demand, benefits outweigh costs to the economy, at least for now. But unprecedented experiments can have unprecedented consequences, and down the road, US flexibility to respond to geopolitical, climate and other emergencies will be impaired.

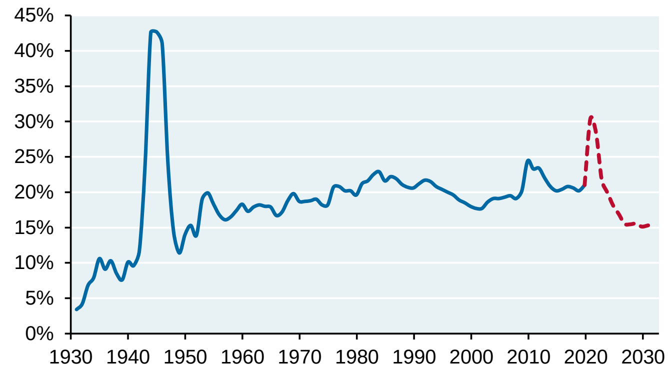
What would be needed to bring US Federal debt back down to pre-virus levels by 2030? Follow the red lines

Raise tax revenues to their highest levels on record
Tax revenue as a % of GDP



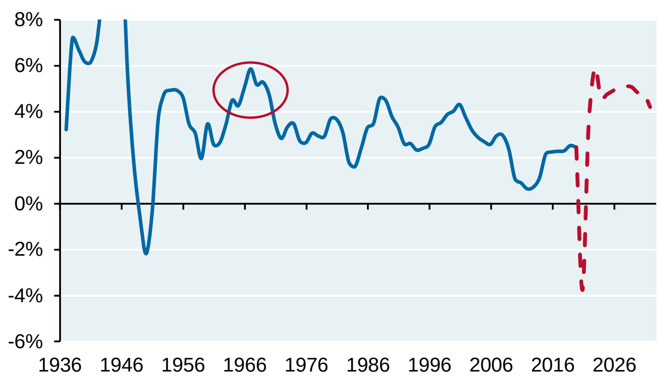
Source: OMB (history), CRFB (projections). 2020.

Cut spending to pre-WWII levels
Government spending as a % of GDP



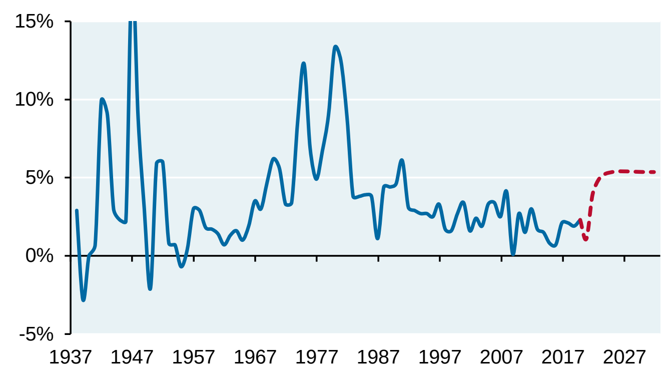
Source: OMB (history), CRFB (projections). 2020.

Reproduce 1960's growth boom
y/y% change in real GDP, 5-year annualized



Source: BEA (history), CRFB (projections), JPMAM. 2020.

Generate higher inflation...but not too high
y/y% change in headline CPI

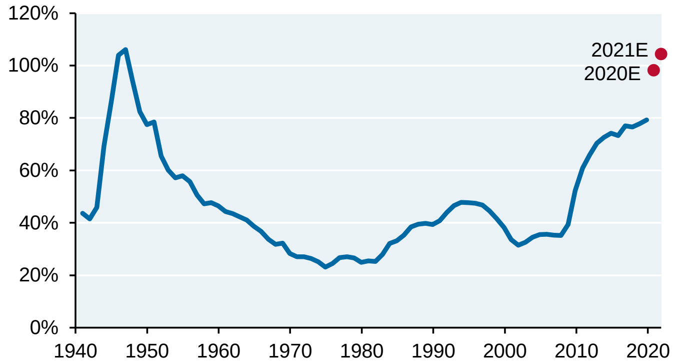


Source: BLS (history), CRFB (projections). 2020.

The last charts this year probably won't impact markets anytime soon, but they do make me thankful that I'm closer to the end of my career than to the beginning. It would not be pleasant to be an investment strategist when/if the consequences of these charts have to be dealt with.

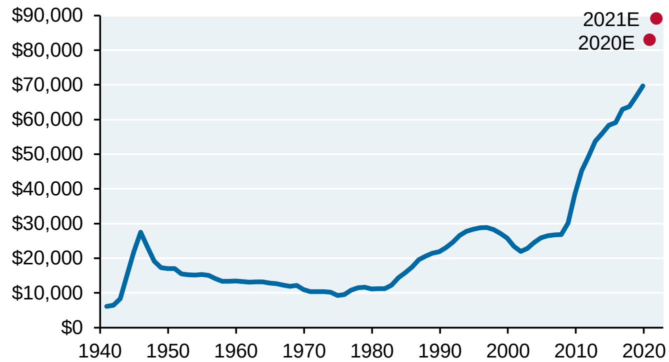
While the typical chart shows Federal debt relative to GDP, the second one shows Federal debt in real terms **per working age person**, since that's the source of tax revenue that will eventually service the debt. This chart picks up the impact of worsening demographics on the debt burden in addition to the surge in the debt itself. If someone wants to argue that this kind of thing led to the end of prior reserve currency nations, I would not stop them.

Gross federal debt held by the public
% of US GDP



Source: Congressional Budget Office. September 2020.

Gross federal debt held by the public
2012 dollars, debt per working-age person

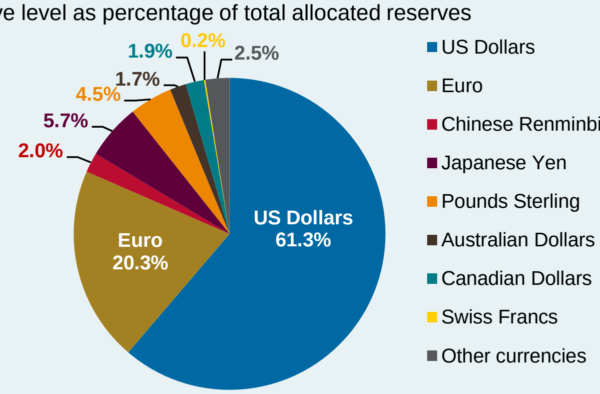


Source: Census, CBO, BEA, CRFB. 2020.

A timeline of reserve currencies or dominant trade currencies (years are approximate):

- Rome: 1st century BC – 4th century AD
- Byzantine empire: 5th century
- Arabian Dinar: 7th to 10th centuries
- Florence: 13th to 15th centuries
- Portugal: 1450 to 1530
- Iberian Union: 1530 to 1640
- Netherlands: 1640 to 1720
- France: 1720 to 1815
- UK: 1815 to 1920
- US: 1920 -

Currency composition of foreign exchange reserves
Reserve level as percentage of total allocated reserves



Source: IMF. Q2 2020.

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Mr. Cembalest is also a member of the J.P. Morgan Asset & Wealth Management Investment Committee and previously served on the Investment Committee for the J.P. Morgan Retirement Plan for the firm's more than 256,000 employees.

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Adopted on October 20, 2015

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